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Abstract

Neighborhood stress stemming from exposure to physical and social decay, as well as violence and crime may be a critical risk factor for risky sexual behaviors among adolescents. The present study sought to: 1) characterize the prospective association of neighborhood stress with adolescent sexual risk behaviors; 2) test whether depression and perceived peer risk norms mediate this association, as proposed by the stress and coping hypothesis and social control theory, respectively; and 3) test whether plausible alternative hypotheses to the stress and coping hypothesis and social control theory can explain the data as well as these hypotheses. Path analysis was used to address these aims in longitudinal study of 1,612 Black adolescents (mean age = 15.14 years [$SD = 1.06$]; 60% female). Data from baseline, 12-month, 18-month, and 36-month assessments were used for analyses. Results indicated that: 1) neighborhood stress was positively, longitudinally associated with number of vaginal sex partners; 2) the effect of neighborhood stress on subsequent condom use was mediated by depressive symptoms, providing partial support for the stress and coping hypothesis; and 3) the effect of neighborhood stress on subsequent perceived peer risk norms was mediated by number of vaginal sex partners, providing partial support for an alternative hypothesis to the social control theory. These findings suggest that neighborhood stress increases number of sexual partners and decreases condom use among adolescents, and that its effect on the latter acts indirectly via depressive symptoms. Future research should clarify whether neighborhood-wide interventions would reduce risky sexual behavior among adolescents.

Keywords: neighborhood stress, neighborhood disorder, exposure to community violence, sexual risk behaviors, social control theory, stress and coping hypothesis

THE LONGITUDINAL ASSOCIATION OF SEXUAL RISK BEHAVIORS AND
OUTCOMES AMONG BLACK ADOLESCENTS: MAIN EFFECTS AND
THEORETICALLY-INFORMED MEDIATION

by

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Dissertation

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Acknowledgments

This dissertation is dedicated to Jon Eguren-Juarez, the person who has been both my anchor and my sail throughout these past 10 years of higher education. *Te amo, mi esposo.*

This dissertation is also dedicated to the LaFont family, including my great-grandparents, grandparents, and parents, who taught me to use my privilege in service of helping others.

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The Longitudinal Association of Neighborhood Stress and Sexual Risk Behaviors and Outcomes among Black Adolescents: Main Effects and Theoretically-Informed Mediation

In the United States, sexual transmission accounts for approximately 72% of HIV cases among men and 57% of cases among women (Ebrahim, McKenna, & Marks, 2005). Sexually transmitted infections (STIs), including HIV, cost the U.S. healthcare system approximately \$16 billion annually, with an incidence of 20 million new cases per year and prevalence of approximately 110 million cases (Centers for Disease Control and Prevention [CDC], 2013). Sexual risk behaviors also contribute to a number of other curable and non-curable bacterial and viral infections, as well as unintended pregnancy and elective abortions, all of which together contribute to the loss of over 2 million disability adjusted life years per year in the United States (Ebrahim et al., 2005). In short, sexual risk behaviors cause prevalent, costly, impairing, and dangerous health consequences.

Adolescents are disproportionately vulnerable to STIs, with half of all new STI diagnoses occurring among individuals aged 15-24, despite adolescents constituting 25% of the sexually active population (CDC, 2013). Furthermore, 22% of all new HIV diagnoses occur among individuals aged 13-24 (CDC, 2016). In particular, Black adolescents have disproportionately higher rates of HIV (CDC, 2016) and other STIs (CDC, 2014) compared to their White and Latino/a peers. For example, among adolescents aged 15-19, 1.8 White adolescents per 100,000 were HIV infected while the rate among Black adolescents was 36.2 (CDC, 2016). These disquieting rates identify adolescents of Black racial backgrounds as an important at-risk group that could benefit most from STI/HIV prevention research.

Behavioral Health STI/HIV Prevention Research

The onset of the HIV epidemic and alarming STI rates have led to STI/HIV prevention research becoming an important priority within the past few decades. The development of STI/HIV prevention programs has benefitted from research on individual-level factors that influence sexual risk behaviors. Models of health behavior that guide STI/HIV prevention research emphasize cognitive and motivational predictors of sexual risk behaviors. For example, the Theories of Reasoned Action and Planned Behaviors (Ajzen, 1991; Fishbein & Ajzen, 2010), Social Cognitive Theory (Bandura, 1986), and the Health Belief Model (Becker & Rosenstock, 1984) have played a prominent role in shaping STI/HIV prevention research (Montaño & Kasprzyk, 2015), and meta analyses have found cognitive and motivational factors highlighted in these models to be good predictors of condom use (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Albarracín et al., 2003). However, meta-analyses examining the efficacy of interventions based in these cognitive/motivational theories found equivocal intervention efficacy among adolescents (Albarracín et al., 2005; Goesling, Colman, Trenholm, Terzian, & Moore, 2014). These equivocal results, along with a general growing focus on ecological factors implicated in adolescent development (Smetana, Campione-Barr, & Metzger, 2006), have prompted researchers to posit that intervention outcomes may be enhanced by incorporating a focus on contextual and environmental risk factors (DiClemente et al., 2008; Herbst et al., 2005). Indeed, neighborhood and community-based intervention trials that target broader determinants of sexual risk behavior have yielded encouraging findings (Hennessy et al., 2013; Kelly et al., 1997; Sikkema et al., 2005; Sikkema et al., 2000). Hence, examining environmental predictors of sexual risk behavior has recently become an important priority in STI/HIV prevention research.

Neighborhood Stress: An Environmental Influence on Sexual Risk Behaviors

Research investigating the association of environmental factors with sexual risk behaviors is burgeoning. One such environmental factor, low socioeconomic status (SES), has been extensively examined as a risk factor for sexual risk behavior (Adler, 2006; Ickovics et al., 2002). Yet, well-designed studies of SES and sexual risk behavior among adolescents have yielded inconsistent and contradictory findings (Kipping, Smith, Heron, Hickman, & Campbell, 2015; Langille, Hughes, Murphy, & Rigby, 2005; Santelli, Lowry, Brener, & Robin, 2000). One explanation for these mixed findings is that SES, ostensibly an environmental indicator, is an insufficient measure of one's environment. SES indicators provide economic information but do not account for peoples' day-to-day experiences in their proximal living environments (Ewart & Suchday, 2002). Though SES is correlated with neighborhood environments and conditions, it does not account for varying degrees of structure and cohesion among low SES neighborhoods that create disparate environments across equivalent levels of poverty. Using neighborhood-level SES census data does not solve this problem, as census tracts do not necessarily fit the boundaries established by residents, and as such may not account for people's varying patterns of daily life and socialization, which yield differential exposures to neighborhood stressors (Ewart & Suchday, 2002; Latkin, German, Vlahov, & Galea, 2013; Taylor, 1997). Hence, both individual-level and neighborhood-level SES indicators are not optimal methods of determining the conditions of people's environments.

Distinct from SES, *self-reported* exposure to neighborhood conditions and events yields more accurate and specific information about people's experiences and may have more relevance to and greater association with sexual risk behaviors than does SES (Cohen et al., 2000; Ewart & Suchday, 2002). Self-reported exposure to adverse neighborhood events and conditions is often referred to as "neighborhood stress." Neighborhood stress is operationalized in a variety of ways,

most often by either neighborhood disorder, which refers to markers of physical and social decay (e.g., vacant houses, drug exchanges), or exposure to community violence, which refers to learning of or witnessing crimes of physical violence (e.g., mugging, stabbing) in one's neighborhood or against one's family or friends. It has also been recommended that neighborhood stress be operationalized as a unitary construct encompassing the two aspects (Ewart & Suchday, 2002), and will be referenced as such in the present study.

An emerging literature suggests that neighborhood stress may be a critical risk factor for sexual behaviors that elevate HIV/STI transmission risk. Two reviews concluded that there is evidence linking *exposure to community violence* with sexual risk behaviors among adolescents. Voisin, Jenkins, & Takahashi (2011) reviewed eight studies with diverse samples of adolescents and concluded that exposure to community violence was associated with sexual risk behaviors. In another review, Voisin, Hong, and King (2012) examined factors associated with sexual risk behaviors among detained adolescents, including community violence exposure. They reported that the two studies that examined the effect of community violence exposure on sexual risk behaviors supported the association. Together, these reviews reported that witnessing community violence was associated with a two to three times greater likelihood of having sex with a risky partner (e.g., a partner who has multiple other partners), being high on alcohol or drugs during sex, or having a partner who was high on alcohol or drugs during sex. Though these reviews represent promising first steps to characterizing the association between neighborhood stress and sexual risk behaviors among adolescents, they are limited in scope due to their inclusion of only exposure to community violence and omission of the neighborhood disorder component of neighborhood stress.

A recent literature review and synthesis conducted by LaFont and Venable (2017) clarified the literature on neighborhood stress and sexual risk using a broader definition of neighborhood stress, as proposed by Ewart and Suchday (2002), including both neighborhood disorder and exposure to community violence. This review of sixteen empirical studies assessed the association of self-reported neighborhood stress with sexual risk behaviors among adolescents and concluded that the association is supported by methodologically robust research (see LaFont & Venable, 2017). Though six of these papers found no evidence in support of the association, these papers were characterized by methodological weaknesses, including the use of measurement tools without psychometric support, and statistical limitations, including the use of categorical or dichotomous variables for sexual risk behaviors with low base rates. Furthermore, the effect sizes of the studies with positive findings varied as a function of the quality of neighborhood stress measures used in the studies, such that those that used a validated measure of neighborhood stress tended to have higher effect sizes (aOR range = 1.04 to 4.14) than those that did not use validated measures of neighborhood stress (aOR range = 1.06 to 1.70). Of three longitudinal studies with follow-up time intervals of 6 months, 1 year, and 2 years, only the 1-year study found evidence for the longitudinal association of neighborhood stress and sexual risk behaviors. All three longitudinal studies were characterized by methodological and measurement limitations, including using a single-item, non-validated, or dichotomous measure of neighborhood stress. The positive finding for a 1-year longitudinal effect of neighborhood stress on sexual risk, however, encourages further longitudinal research that overcomes the methodological and measurement limitations that have characterized existing longitudinal research.

Overall, LaFont and Venable's (2017) review concluded that the statistical significance and effect sizes of the association of neighborhood stress and sexual risk behaviors varied based on the methodological strength of the studies. Further, the authors noted that most studies were based on cross-sectional data and that there has been little research on mechanisms that underlie the association of neighborhood stress and sexual risk behaviors. Review findings confirm the importance of additional research that uses psychometrically sound measures and longitudinal designs to better characterize the prospective association of neighborhood stress and sexual risk behaviors. In addition, needed are theory-based studies that inform the understanding of explanatory mechanisms that account for the association of neighborhood stress and sexual risk behaviors among adolescents.

Potential Mediators Linking Neighborhood Stress to Sexual Risk Behaviors

Two mechanisms have been proposed to account for the association between neighborhood stress and sexual risk behaviors. These mechanisms include perceived risk norms and depressive symptoms, as proposed by social control theory and the stress and coping hypothesis, respectively. As described below in detail, there is presently limited and inconsistent evidence for these proposed mechanisms. However, all of the studies that tested these mechanisms found partial support for the respective theory tested. Furthermore, none of these studies assessed the mechanisms linking neighborhood stress and sexual risk behaviors using a longitudinal research design.

Social control theory and the role of perceived peer risk norms. The first framework proposed to account for the association between neighborhood stress and sexual risk behaviors has been variously referred to as social control theory (Voisin, Neilands, Salazar, Crosby, & DiClemente, 2008), social disorganization theory (Tewksbury, Higgins, & Connor, 2013), and

broken windows theory (Cohen et al., 2000; Senn, Walsh, & Carey, 2016). These theories, first proposed by criminologist George Kelling, sociologist James Wilson, and social psychologist Philip Zimbardo, have been developed over the past several decades within sociology, criminology, and social psychology research (Wilson & Kelling, 1982; Zimbardo, 1969). Common features of these theories (henceforth collectively referred to as social control theory) include the idea that the conditions and appearance of a physical environment influences individual behaviors. Specifically, disordered environments characterized by physical and social decay as well as violence and crime signal to those in them that there is a weak influence of formal and informal social control, and as such, that typical societal norms for what constitutes prohibited behavior do not apply (Schaefer, 2009). Stated another way using the broken windows metaphor, "...if a window in a building is broken and is left unrepaired, all the rest of the windows will soon be broken...[a] broken window is a signal that no one cares" (Wilson & Kelling, 1982, para. 11). Most of the research conducted using social control theory has assessed the relationship between neighborhood disorder and criminal behavior. As such, much evidence supports the hypothesis that neighborhood disorder generates crime (Skogan, 2012).

Cohen and colleagues (2000) were the first to apply social control theory to sexual risk by introducing the hypothesis that neighborhood deterioration and crime diminish informal social control, leading to increased sexual risk behaviors. In their epidemiological study, they tested whether the rates of gonorrhea were greater in New Orleans neighborhoods with higher deterioration. They found that neighborhood deterioration ratings were positively associated with rates of gonorrhea. Furthermore, these effects persisted over and above the effects of SES indicators, including income, education, and employment.

Since then, one study has tested the social control theory with respect to sexual risk using self-reported neighborhood stress in an adolescent sample (Voisin et al., 2008). In order to test the theory's hypothesis that neighborhood stress promotes riskier sex by promoting riskier norms, this study examined the mediating effect of *perceived peer risk norms*¹ in the association of neighborhood stress and sexual risk behaviors. Applying path analysis to cross-sectional data obtained from a youth detention sample, Voisin and colleagues (2008) found a significant serial mediation effect of gang membership and perceived peer risk norms in sequence. Specifically, they found that community violence exposure was associated with gang membership, which in turn was associated with perceived sexual risk norms, which in turn was associated with a composite sexual risk behavior index. Although this cross-sectional study lends preliminary evidence for the social control theory among adolescents, further research is needed to confirm this mediation longitudinally, with a broader definition of neighborhood stress that includes neighborhood disorder, and with a more representative sample of adolescents. Hence, in addition to testing the main longitudinal effect of neighborhood stress on sexual risk, a second research aim addressed by the present study is to examine whether perceived peer risk norms, as proposed by social control theory, help to account for the association of neighborhood stress and sexual risk behaviors in a large, longitudinal study of adolescents.

The stress and coping hypothesis and the role of depressive symptoms. A second framework, referred to here as the stress and coping hypothesis, posits that neighborhood stress serves as a chronic stressor that, for some, leads to risk behavior as an emotion-focused coping response (Senn et al., 2016). This hypothesis adapts elements of a broader stress and coping

¹ Perceived peer risk norms measure participants' judgments of how often their peers engage in various sexual risk behaviors (e.g., how often peers use condoms, how many sexual partners their peers have).

model proposed by Lazarus & Folkman (1984). According to the model, one strategy that individuals use to manage the impact of uncontrollable stressors (such as neighborhood disorder and exposure to community violence) is emotion-focused coping. At its best, emotion-focused coping involves beneficial behaviors, such as seeking social support (Brannon, Feist, & Updegraff, 2007). Yet, some individuals pursue emotion-focused coping via engaging in health risk behaviors, such as substance use (Comeau, Stewart, & Loba, 2001; Cooper, 1994) or sexual risk behaviors (Folkman, Chesney, Pollack, & Phillips, 1992; Latkin et al., 2013; McKirnan, Venable, Ostrow, & Hope, 2001) in order to manage distress.

Applying the stress and coping model to neighborhood stress extends the model by proposing the hypothesis that neighborhood stress is a chronic stressor that results in negative affect, and that people seek to manage or reduce negative affect by engaging in risky sexual behaviors that offer short term reward, but pose longer term health risks (Sampson, Morenoff, & Gannon-Rowley, 2002). This stress and coping hypothesis is plausible, given both evidence that neighborhood stress is associated with negative affect indicators (e.g., depressive symptoms), as well as that depressive symptoms are associated with sexual risk behaviors. First, a review of the association between neighborhood stress and depressive symptoms, which included longitudinal studies of adolescents, concluded that there is a positive association between neighborhood stress and depressive symptoms (Mair, Roux, & Galea, 2008). Second, studies using large, nationally representative samples of adolescents have found that depressive symptoms are significantly associated with sexual risk behaviors in both cross-sectional (Hallfors et al., 2004) and longitudinal (Khan et al., 2009) analyses. However, some studies have found that the association is only significant among males or for certain sexual risk indicators (Lehrer, Shrier, Gortmaker, & Buka, 2006; Shrier, Harris, Sternberg, & Beardslee, 2001). Nonetheless, the overall evidence

supports the existence of some association between depressive symptoms and sexual risk among adolescents. Hence, there is evidence for both the association of neighborhood stress and depressive symptoms and the association of depressive symptoms and sexual risk among adolescents, making a mediational sequence as proposed by the stress and coping hypothesis plausible.

Though no studies have tested this mediational sequence among adolescents, four studies involving adult samples provide evidence to support the stress and coping hypothesis. The studies tested whether distress indicators, including depression, anxiety, and perceived stress, mediated the association of neighborhood stress and sexual risk behaviors. Senn and colleagues' (2016) study of 508 adults (68% Black) from a publicly-funded STI clinic found that poor mental health (depression and anxiety) mediated the association of community violence exposure and number of unprotected sex episodes with non-steady partners, among women only. Bowleg and colleagues' (2014) study of 526 Black men found a significant mediating effect of depression in the relationship between neighborhood stress and a composite sexual risk indicator consisting of condom use frequency and number of partners. Bobashev and colleagues' (2009) study of 1,730 adults (76% Black) found that psychological distress (indexed by an anxiety, depression, and somatization latent factor) mediated the association of neighborhood stress and transactional sex involvement among men but not among women. Finally, in their sample of 838 adults (97% Black) with drug use histories, Latkin, Curry, Hua, & Davey (2007) found that depression mediated the association of neighborhood stress and two of four sexual risk behaviors that were measured—having sex with an IV drug user and buying sex—among men only. The reason for these mixed findings is unclear, as the results do not appear to systematically differ by gender or across studies.

In sum, the mediating effect of depression in the association of neighborhood stress and sexual risk has been tested in cross-sectional studies of adults and has yielded mixed results. Research among adolescents suggest that negative affect is a plausible mediator of neighborhood stress and sexual risk among youth, though the literature lacks longitudinal, mediational research to confirm this hypothesis. Confirming this hypothesis with longitudinal mediation research would advance this important area of inquiry by aiding in the understanding of the mechanisms that precipitate risky health behaviors in a population vulnerable to STIs and HIV, ultimately informing the development of much needed intervention research. Accordingly, another research aim addressed by the present study is to test whether depressive symptoms, as proposed by the stress and coping hypothesis, mediate the association of neighborhood stress with sexual risk in a longitudinal study of adolescents.

The Present Study: Aims and Hypotheses

Currently, there is little methodologically sound research examining the longitudinal association of neighborhood stress and sexual risk behavior among adolescents. Furthermore, there is no existing longitudinal research that tests either the stress and coping hypothesis or social control theory as explanatory models for the association between neighborhood stress and sexual risk behavior among adolescents. This study aimed to address these gaps by characterizing the strength of the effect of neighborhood stress on sexual risk behaviors over time, as well as testing the two explanatory mechanisms that may account for this relationship. This study conducted secondary data analysis of data from the NIMH-funded Project iMPPACS, a large, multi-city health promotion trial designed to clarify the impact of mass media and small group interventions on the reduction of sexual risk behavior in Black youth (Hennessy et al., 2013; Romer et al., 2009; Vanable et al., 2008).

The aims of the present study were to:

1. Characterize the longitudinal association of neighborhood stress on sexual risk behaviors among Black adolescents using a validated measure of neighborhood stress as well as a variety of sexual risk indicators. It was hypothesized that neighborhood stress would be positively and longitudinally associated with sexual risk behaviors and outcomes.
2. Test whether the stress and coping hypothesis and social control theory help to account for the relationship between neighborhood stress at baseline and subsequent sexual risk behaviors and outcomes by assessing the mediating effects of depressive symptoms and perceived peer risk norms, respectively. It was hypothesized that depressive symptoms and perceived peer risk norms would mediate the longitudinal association of neighborhood stress and sexual risk behavior outcomes.
3. Using an alternative model with a different configuration of hypothesized relations among the same variables, test whether plausible alternative hypotheses to the stress and coping hypothesis and social control theory can explain the data as well as these hypotheses, in order to strengthen confidence in any positive findings and elucidate possible unexplored avenues of explanation.

Methods

Participants

Participants were Black adolescents recruited to participate in Project iMPPACS, a study that examined the impact of mass media and small group interventions for HIV/STI risk prevention (Hennessy et al., 2013; Romer et al., 2009). The study was conducted in the United States in two matched northeast cities (Providence, Rhode Island [$N = 408$], and Syracuse, New

York [$N = 408$]) and two matched southeast cities (Columbia, South Carolina [$N = 387$], and Macon, Georgia [$N = 409$]). The 1,612 adolescents were aged 14 to 17 (mean age = 15.14, $SD = 1.05$, 60% female) at baseline. Participants in Macon and Syracuse were randomly assigned to receive the mass media intervention and participants in all cities were also randomized to receive small-group HIV-prevention intervention or a time-equivalent general health promotion intervention. Project iMPPACS participants were recruited from August 2006 to January 2008 using a variety of methods, including recruitment from community organizations (i.e., Boys and Girls Clubs), participant referral, respondent-driven sampling, street outreach, referral by adults in the community, and self-referral. Most participants ($N = 1,188$, 74%) qualified for free or reduced-price lunch at school. Black adolescents were selected as the target sample for Project iMPPACS because their disproportionately higher rates of HIV and STIs (CDC, 2016; CDC, 2014) identify them as an important at-risk group in need of STI/HIV prevention research. Furthermore, Black adolescents are disproportionately more likely to live in disordered and disadvantaged neighborhoods (Williams & Jackson, 2005), compared to their non-Black peers, further increasing the importance of examining the association between neighborhood stress and sexual risk in this population.

Measures

Audio computer assisted self-interviews (ACASIs) were administered at baseline, and 3-, 6-, 12-, 18-, and 36-months follow-ups. As compared to self-administered questionnaires or assessments involving direct interviewer/human contact, ACASIs are the preferred method for obtaining self-report data because they minimize memory and motivational biases and override variable literacy skills that can undermine validity and interpretability of self-report data (Romer et al., 1997; Schroder, Carey, & Vanable, 2003; Vanable et al., 2009). Out of the 1,612 baseline

participants, 1,460 (91%), 1,483 (92%), and 1,382 (86%) participated in 12-, 18- and 36-month follow-ups, respectively. Upon completion of informed assent, participants were paid for the completion of the ACASI with increasing compensation (\$30 to \$60) for each subsequent time point. Participants also provided urine samples at baseline and 6, 12, and 18 month follow-ups, which were tested for chlamydia, gonorrhea, and trichomonas. All study protocols were approved by the Institutional Review Boards at the participating universities.

Neighborhood stress. The independent variable, neighborhood stress, was measured at baseline using a validated measure of neighborhood stress: The City Stress Inventory (Ewart & Suchday, 2002). At baseline assessment only, participants completed a 10-item version of the City Stress Inventory. The City Stress Inventory asks about stressful events in participants' neighborhoods over the past year (see Appendix A). Participants rated each item on a 1 (Never) to 4 (Often) scale. The mean of the 10 items was used as an independent variable in analyses. The City Stress Inventory has evidenced good internal consistency and temporal stability in previous samples of urban adolescents (Ewart & Suchday, 2002) and evidenced good internal consistency in the current sample (Cronbach's $\alpha = .85$).

Depressive symptoms. As a proxy measure for negative affect, this study assessed self-reported depressive symptoms using an eight-item version of The Center for Epidemiological Studies Depression Scale (CES-D; Sales, Lang, Hardin, Diclemente, & Wingood, 2010; Santor & Coyne, 1997). Participants reported on their depressive symptoms over the past week using a 1 (less than 1 day) to 4 (5-7 days) scale (Appendix B). The mean of the eight items was used as a mediating variable in analyses testing the mediation proposed by the stress and coping hypothesis. The CES-D scale evidenced good internal consistency in the present sample (Cronbach's α ranged from .85 to .89 across assessments).

Perceived peer risk norms. Two items measured perceived peer risk norms for vaginal sex (see Appendix C; Stanton et al., 1995). Descriptive norms (that is, perceived behaviors of social referents), not injunctive norms (that is, perceived attitudes of social referents regarding specified behaviors), were selected in order to maintain consistency with previous literature (e.g., Voisin et al., 2008), and due to descriptive norms having a greater influence on adolescent sexual behavior compared to injunctive norms (van de Bongardt, Reitz, Sandfort, & Deković, 2015). Furthermore, the items asked about friends' behaviors, not just general peers' behaviors, because perceived sexual risk of close friends has more influence on adolescent sexual risk than does perceived sexual risk of general peers (van de Bongardt, Reitz, Sandfort, & Deković, 2015). The items led with the prompt, "Thinking about your friends who are your age" and asked participants to rate the proportion of their friends who: 1) have had vaginal sex; and 2) who use a condom every time they have sex. Items were rated on a 1 (none) to 6 (almost all of them) scale. The condom use item was reverse scored such that a greater score indicated riskier perceived peer norms. The mean of the two items was used as a mediating variable in analyses testing the mediation proposed by the social control theory.

Sexual risk behaviors and outcomes. Four behavioral measures of sexual risk (number of partners and three condom use variables), as well as a biological outcome (STI acquisition) were used as dependent variables in analyses.

Number of partners. Number of sexual partners was indexed by the participant's number of vaginal sex partners in the past three months. Participants who indicated that they had not initiated vaginal sex were not administered this item, and automatically assigned a value of 0 for this variable. Otherwise, participants were asked, "With how many people have you had vaginal sex (penis in vagina) in the past 3 months?" Responses were allowed to range from 0 to 98.

Condom use. Participants who indicated that they were sexually active answered questions regarding their condom use during the past three months, as well as condom use on the most recent occasion of sexual activity. A recent review recommended that condom use measurement studies include three key condom use variables: relative frequency of condom use, count of condom unprotected episodes, and condom use at last episode (Fonner, Kennedy, O'Reilly, & Sweat, 2014). Each measure has different strengths for indexing condom protected vaginal sex. Specifically, relative condom use frequency and count of unprotected episodes complement one another by providing a relative and absolute measure of condom use, respectively. Condom use at last episode is another preferred condom use variable because it minimizes recall bias (Fonner et al., 2014).

Relative condom use frequency. To assess relative condom use frequency, sexually active participants were asked, "In the last 3 months, how often would you say that you and your partner or partners used a condom from start to finish when you had vaginal sex? Would you say that you used condoms never, rarely, some of the time, most of the time, nearly every time, or every time?" (Schroder et al., 2003). Responses were rated on a 1 (never) to 6 (every time) scale.

Count of unprotected episodes. To assess absolute frequency of condom use, participants were asked, "In the past 3 months, how many total times have you had vaginal sex (penis in vagina) without using a condom?" Responses were free to range from 0 to 300.

Condom use at last episode. The final condom use indicator was a dichotomous (no = 1; yes = 2) measure of condom use at the participant's last vaginal sex episode. The question began with the statement, "Now all of the following questions ask about the LAST TIME you had vaginal sex." To assess condom use at last episode, participants were asked, "The last time you had vaginal sex, did you or your partner use a condom?"

Incident STIs. At baseline and 6, 12, and 18 month follow-ups, participants provided urine samples that were analyzed for three common STIs (chlamydia, gonorrhea, and trichomonas). Chlamydia and gonorrhea were tested using Becton-Dickinson's DNA amplification technology, Strand Displacement Amplification (Van der Pol et al., 2011). Trichomonas was tested using real-time polymerase chain reaction (PCR) assay (Caliendo et al., 2005). These urine tests are highly sensitive and specific. The urine specimens were analyzed at the Emory University Microbiology Laboratory. Results were coded as to indicate whether participants tested negative or positive (0 = negative; 1 = positive) for any STI.

Covariates. Potentially confounding variables that may influence neighborhood stress or sexual risk behaviors were included in statistical analyses as covariates. These include free lunch status (as a proxy for SES), age, and gender (Adler, 2006; Ewart & Suchday, 2002; Halpern et al., 2004; Ickovics et al., 2002; Pflieger, Cook, Niccolai, & Connell, 2013). Including covariates strengthens the support of an association of neighborhood stress and sexual risk behaviors because it demonstrates that the effect is not merely due to confounding associations with permanent demographic variables or intractable socioeconomic circumstances. At baseline, participants reported their age in years, gender (male or female), and whether they were eligible for a free or reduced price lunch at school (yes/no). City of residence (1 = Syracuse; 2 = Macon; 3 = Providence; 4 = Columbia) and treatment condition (1 = media city + HIV-prevention group; 2 = nonmedia city + general health promotion group; 3 = media city + general health promotion group; 4 = nonmedia city + HIV-prevention group) were dummy coded in order to be included as covariates. All regression and SEM analyses included gender, age, city of residence, treatment condition, and qualification for free lunch status (as a proxy for SES) as covariates. Covariates did not include race because the iMPPACS sample is racially homogenous.

Data Analytic Strategies

Data preparation and examination. Data preparation and examination was performed with SAS version 9.4. Before testing any hypothesized effects, the data were examined to ensure they were appropriate for analyses. First, means, standard deviations, and distributions/frequencies of all study variables were screened for unexpected patterns, including outliers and non-normality when normality was expected. Any variables with skewed distributions that were expected to be normal were log transformed. Any scores that were outliers as indicated by $|z| > 3.00$ were converted to the value of the next most extreme score that fell within three standard deviations of the mean ($|z| \leq 3.00$; Kline, 2015). Specifically, the number of vaginal sex partners (skewness ranged from 10.29 to 16.96 across assessments) and number of condom unprotected episodes variables (skewness ranged from 7.93 to 16.03 across assessments) required outlier replacement and log transformation due to positive skew. The depressive symptoms variable (skewness ranged from 1.51 to 1.72 across assessments) required log transformation only, due to positive skew. Next, internal consistency, as indexed by Cronbach's alpha, was assessed for multi-item measures, including neighborhood stress and depression, to ensure that item responses were internally consistent within the present sample. Both measures evidenced good internal consistency (see the above Measures section).

To screen for any systematic patterns of missing data, participants with incomplete data (those who missed at least one of the three follow up assessments; $N = 313$ [19% of the baseline sample]) were compared to those with complete data ($N = 1299$) to test for any significant demographic or conceptually-pertinent differences at baseline. Those with missing data reported greater baseline neighborhood stress, $t(1610) = 4.35, p < .001$, greater baseline number of vaginal sex partners, $t(1610) = 4.27, p < .001$, and were older at baseline, $t(1609) = 3.24, p = .001$, were

more likely to be from Providence or Columbia, $\chi^2(3, N = 1612) = 45.70, p < .001$, and were more likely to be male, $\chi^2(1, N = 1612) = 21.59, p < .001$, compared to those with complete data. Participants with and without missing data did not differ from each other with respect to free lunch status, relative condom use frequency at baseline, number of condom unprotected episodes at baseline, whether they reported using a condom at last episode at baseline, or STI diagnosis at baseline. To accommodate missing data in any mediators and outcome variables, the default missing data procedure in *Mplus*, Full-Information Maximum Likelihood parameter estimation, was used, which determines the parameters that maximize the probability of the sample data on the basis of all the available data and has been demonstrated to produce unbiased estimates (Graham, Cumsille, & Elek-Fish, 2003). Participants with missing data for independent variables and covariates were excluded from analyses ($N = 178$).

Testing main/total effect of neighborhood stress on sexual risk (without consideration of potential mediating variables). To address Aim 1 and test the main, longitudinal effect of neighborhood stress on sexual risk behaviors and outcomes, a path analysis was performed in *Mplus* Version 7 (Muthen & Muthen, 2012) using maximum likelihood estimation with robust standard errors. Path analysis is an extension of multiple and multivariate regression, but has relative benefits compared to regression analyses in terms of estimating complex relationships among multiple predictors and outcomes in a single model simultaneously, while accounting for missing data and non-normality of outcome variables. Sexual risk variables, including the three condom use variables, number of vaginal sex partners, and STI acquisition, were regressed on baseline neighborhood stress. To account for both shorter-term (e.g., 18 months) and longer-term (e.g., 36 months) effects, the condom use and number of partner dependent variables were the participant's average score from their report of

these behaviors at 18 and 36 months (see below for further assessment timeline rationale). For cases in which a participant was missing data for either the 18 or 36 month assessment, data was used from the assessment point in which the participant had existing data. As the STI analysis was not performed at 36 months, the STI outcome variable was from the 18 month assessment only. Standardized and unstandardized parameter estimates as well as R^2 of outcome variables were examined to determine whether neighborhood stress at baseline is significantly associated with the sexual risk behaviors and outcomes at subsequent assessment points, as hypothesized. The path analysis controlled for gender, age, city of residence, treatment condition, and free lunch status, as well as baseline levels of all outcome variables. Analyses also included covariances among covariates and independent variables and covariances among all outcome variables. Model fit indices were not available, as the model was fully saturated (i.e., all possible parameters were estimated).

Testing mediation models using path analysis. In order to accomplish Aims 2 and 3, path models were tested in *Mplus* Version 7 (Muthen & Muthen, 2012).

Timeline of mediating and outcome variables. To make the longitudinal mediation model timeline consistent with time orders of the independent, mediating, and dependent variables, neighborhood stress at baseline was used as an independent variable, depressive symptoms and perceived peer risk norms at the 12-month follow-up were used as mediators, and the average of risky sexual behaviors at the 18- and 36-month follow-ups were used as dependent variables. This timeline was selected for both conceptual and statistical reasons. First, 10-year trajectory analyses suggest that neighborhood stress tends to be stable over time (Tewksbury et al., 2013), making a longer (e.g., 18, 36 month) effect of neighborhood stress on sexual risk plausible. In addition to this conceptual plausibility, it is also statically preferable to

analyze later outcomes over earlier ones because variability in the sexual risk outcome variables were smaller earlier in the study. That is, because the sample age range at baseline was 14-17, a large percentage of participants were not sexually active in the earlier assessment phases. Using earlier assessment periods would substantially limit variability in some outcomes (e.g., number of partners) and yield more missing data for other outcomes (e.g., condom use). Using later assessment periods helps avoid problems with low variability and missing data in the sexual risk outcome variables. Finally, because there were no a priori hypotheses about baseline neighborhood stress affecting sexual risk at 18 versus 36 months and in order to capture sexual risk effects across multiple time points, the sexual risk dependent variables will be represented as a participant's mean score across 18 and 36 month assessments.

Path analysis of mediation. The path analysis mediation model assessed the direct effect from neighborhood stress to all sexual risk variables. Furthermore, the model included gender, age, city of residence, treatment condition, and qualification for free lunch status as covariates. It also controlled for baseline levels of all mediating and outcome variables and included covariances among covariates and independent variables and covariances among all outcome variables. The path model tested depressive symptoms and perceived peer risk norms as mediators, as proposed by the stress and coping hypothesis and the social control theory (Aim 2). Specifically, the path model tested whether the effect of baseline neighborhood stress on sexual risk behaviors and outcomes at 18 months and 36 months (average) was mediated by depressive symptoms and peer risk norms at 12 months. The analyses also modeled the covariance of the two mediating variables. This mediation model was tested using maximum likelihood estimation with robust standard errors, as was the main/total effect path model. Given that only a saturated path model was examined, model fit indices were not available.

Testing of mediation effects. Sobel tests were used to obtain parameter estimates of mediation effects and to measure statistical significance using the model indirect command in *Mplus*. Furthermore, the analyses were submitted to a bootstrapping test of 1,000 samples to obtain 95% confidence intervals of the observed mediation effects, using the bootstrap and interval commands. Both Sobel tests and bootstrapping confidence intervals were examined in order to balance their risk of type II and type I errors, respectively (Kline, 2015). As effect sizes of mediation effects, proportions mediated (calculated by dividing the indirect effect by the total effect), and bootstrapping confidence intervals (obtained from 95% confidence intervals of the unstandardized estimates of the mediation effects) were examined.

Exploring equivalent models. In order to strengthen confidence in any path analysis (as well as structural equation modeling) findings, the importance of testing equivalent models has been highlighted (Tomarken & Waller, 2005). An equivalent model "...explains the data just as well as the researcher's preferred model but does so with a different configuration of hypothesized relations among the same variables" (Kline, 2015, p. 93). Hence, for Aim 3, an alternative, equivalent model of the proposed mediation models (tested in Aim 2) was examined. For both the stress and coping hypothesis and social control theory, a plausible alternative model involved reversing the order of mediating and outcome variables. Specifically, for the stress and coping hypothesis, rather than depression mediating the association of neighborhood stress and sexual risk, sexual risk may mediate the association of neighborhood stress and depression. The plausibility of this model is suggested by research that indicates that sexual risk behaviors predict subsequent depressive symptoms among adolescents (Hallfors, Waller, Bauer, Ford, & Halpern, 2005). For social control theory, rather than perceived peer risk norms mediating the association of neighborhood stress and sexual risk, sexual risk may mediate the association of neighborhood

stress and perceived peer risk norms. Though it is widely proposed that adolescents' perception of their peers' risk influences their own risk, some analyses support the selection effects over socialization effects (van de Bongardt et al., 2015). That is, rather than adolescents adapting to their peers' level of risk, there is evidence that adolescents instead select into groups of other adolescents whose sexual behavior is similar to theirs. The alternative path model was analyzed using the same processes and procedures that were used for the proposed mediation model.

Results

Descriptive Statistics

Summary statistics for all study variables are shown in Tables 1 and 2. The mean score across neighborhood stress items was 1.97 on the 1 (never) to 4 (often) scale; most items were endorsed (rated a 2 or greater) by the majority of participants. On average, participants also reported experiencing some depressive symptoms ($M = 1.57$ at baseline on a 1 to 4 scale of symptom frequency) and reported the perception that their same-age friends engage in sexual risk behaviors ($M = 3.56$ at baseline on a 1 to 6 scale of proportion of friends). Approximately 53% of the sample reported ever having vaginal sex at baseline. Those who had initiated vaginal sex reported inconsistent condom use at baseline ($M = 4.56$ on a 1 to 6 scale of relative condom use frequency; 28% reported not using a condom during last episode; and reported an average of 2.34 condom unprotected episodes in the past 3 months). At baseline, 8% of participants tested positive for at least one of the three STIs assessed.

Bivariate correlations among all study variables are shown in Table 3. Neighborhood stress was significantly and positively correlated with the hypothesized mediating variables (depressive symptoms and perceived peer risk norms), with small correlation coefficients. Neighborhood stress was also significantly correlated with three of the five sexual risk outcome

variables (number of partners, number of unprotected episodes, and relative frequency of condom use) with negligible to small coefficients, in the expected directions. Neighborhood stress was not significantly correlated with the other two sexual risk outcome variables (condom use at last episode and STI assessment results). With respect to the hypothesized mediating variables' associations with the sexual risk outcome variables, the depressive symptoms variable was not significantly associated with number of vaginal sex partners, but it was significantly associated with the three condom use variables and STI assessment results, with negligible to small coefficients, all in the expected directions. The perceived peer risk norms mediating variable was significantly associated with all five sexual risk outcome variables, with negligible to small coefficients, all in the expected directions. For correlations among the five sexual risk outcome variables, the three condom use variables were significantly associated with one another, with moderate to high coefficients, all in the expected directions. Number of vaginal sex partners was not correlated with relative frequency of condom use but was significantly correlated with number of unprotected episodes and condom use at last episode, with negligible to small coefficients in the expected directions. Finally, the STI assessment results had negligible to small correlations with the other sexual risk variables, all in the expected directions.

Main/Total Effect of Neighborhood Stress Predicting Sexual Risk Behaviors and Outcomes (Without Consideration of Potential Mediators)

The first path analysis tested the main/total effect of neighborhood stress on sexual risk with a multivariate regression that regressed the five sexual risk variables on baseline neighborhood stress and controlled for baseline age, gender, free lunch status, city, and treatment condition as well as baseline levels of all sexual risk outcome variables (Figure 1). Results indicated a significant, positive, longitudinal effect of neighborhood stress on number of vaginal

sex partners ($\beta = .08, b = 0.06, SE = 0.02, p = .005$). Results also indicated a marginally significant, negative, longitudinal effect of neighborhood stress on relative frequency of condom use ($\beta = -.05, b = -0.15, SE = 0.08, p = .08$). Neighborhood stress along with the covariates accounted for 19% of the variance in number of vaginal sex partners and 11% of the variance in relative frequency of condom use. However, the hypothesized associations of neighborhood stress and count of condom unprotected vaginal sex episodes ($\beta = .03, b = 0.04, SE = 0.05, p = .43$), condom use at last episode ($\beta = -.03, b = -0.02, SE = 0.02, p = .27$), and STI assessment ($\beta = .02, b = 0.01, SE = 0.01, p = .55$) were not statistically significant.

Path Analysis Testing the Mediating Effects of Depression Symptoms and Peer Norms

The next path model tested the stress and coping hypothesis and social control theory in terms of their proposed mediating effects of depression symptoms and perceived peer risk norms, respectively, in the relationship between neighborhood stress and the five sexual risk variables. The analysis controlled for baseline age, gender, free lunch status, city, and treatment condition as well as baseline levels of depressive symptoms, perceived peer risk norms, and sexual risk variables (Figure 2).

Results indicated that baseline neighborhood stress was significantly, positively associated with depressive symptoms at 12 months ($\beta = .07, b = 0.04, SE = 0.02, p = .02$) but not perceived peer risk norms at 12 months ($\beta = .01, b = 0.02, SE = 0.04, p = .68$). In turn, depressive symptoms at 12 months was significantly, longitudinally associated with relative frequency of condom use ($\beta = -.14, b = -0.71, SE = 0.19, p < .001$), count of condom unprotected vaginal sex episodes ($\beta = .11, b = 0.30, SE = 0.10, p = .002$), and condom use at last episode ($\beta = -.10, b = -0.12, SE = 0.04, p = .004$), but not number of vaginal sex partners ($\beta = -.02, b = -0.02, SE = 0.04, p = .61$) or STI assessment ($\beta = -.01, b = -0.003, SE = 0.03, p = .90$). Furthermore, perceived peer

risk norms at 12 months was significantly associated with relative frequency of condom use ($\beta = -.14$, $b = -0.29$, $SE = 0.07$, $p < .001$), condom use at last episode ($\beta = -.11$, $b = -0.05$, $SE = 0.02$, $p = .001$), and STI assessment ($\beta = .07$, $b = 0.02$, $SE = 0.01$, $p = .03$), but not number of vaginal sex partners ($\beta = .04$, $b = 0.02$, $SE = 0.02$, $p = .17$) or count of condom unprotected vaginal sex episodes ($\beta = .04$, $b = 0.04$, $SE = 0.04$, $p = .31$). After accounting for these indirect paths involving depressive symptoms and perceived peer risk norms, a significant direct, longitudinal effect of baseline neighborhood stress was found on number of vaginal sex partners ($\beta = .08$, $b = 0.06$, $SE = 0.02$, $p = .009$) but not on other sexual risk outcome variables. This mediation model, including neighborhood stress, depressive symptoms, perceived peer risk norms, and covariates, accounted for 19% of the variance in number of vaginal sex partners, 15% of the variance in relative frequency of condom use, 9% of the variance in count of condom unprotected vaginal sex episodes, 11% of the variance in condom use at last episode, and 4% of the variance in STI assessment.

Mediation effect tests, using Sobel tests and bootstrapped CIs, indicated two significant or marginally significant mediation effects (see Table 4). The first significant mediation involved a mediating pathway from baseline neighborhood stress \rightarrow depressive symptoms at 12 months \rightarrow mean relative condom use frequency at 18 and 36 months ($\beta = -.01$, $b = -0.03$, 95% bootstrapped CI [-0.06, -0.003], $SE = 0.01$, $p = .04$). The analysis indicated that 27% of the total effect of neighborhood stress on relative condom use frequency was mediated by depressive symptoms.

The second mediation involved a mediating pathway from neighborhood stress \rightarrow depressive symptoms at 12 months \rightarrow mean number of condom unprotected vaginal sex episodes at 18 and 36 months ($\beta = .01$, $b = 0.01$, 95% bootstrapped CI [0.001, 0.03], $SE = 0.01$, $p = .07$).

Significance tests for this mediation were mixed, with a marginally significant Sobel test ($p = .07$) versus a significant bootstrapped 95% CI that did not include zero [0.001, 0.03]. Findings indicated that 33% of the total effect of neighborhood stress on number of condom unprotected vaginal sex episodes was mediated by depressive symptoms.

Finally, Sobel testing yielded another marginally significant mediation effect involving a mediating pathway from baseline neighborhood stress \rightarrow depressive symptoms at 12 months \rightarrow condom use at last episode at 18 and 36 months ($\beta = -.01$, $b = -0.001$, 95% bootstrapped CI [-0.01, 0.000], $SE = 0.002$, $p = .07$), however, the 95% bootstrapped CI included zero and 0% of the total effect of neighborhood stress on condom use at last episode was mediated by depressive symptoms.

In sum, the path analysis results supported the stress and coping hypothesis of neighborhood stress by detecting significant indirect/mediating paths from baseline neighborhood stress to depressive symptoms at 12 months and then from depressive symptoms at 12 months to relative frequency of condom use, count of unprotected episodes, and condom use at last episode at 18 and 36 months. Significance tests for the mediating effects of depressive symptoms by both Sobel tests and bootstrapped CIs partially supported these path analyses results for relative condom use frequency (yielding significant significance tests in both the Sobel test and bootstrapped CI), condom unprotected episodes (yielding a marginally significant Sobel test but significant bootstrapped CI), and condom use at last episode (yielding a marginally significant Sobel test and non-significant bootstrapped CI). The analyses did not provide any support for mediating effects of depressive symptoms (as proposed by the stress and coping hypothesis) for the sexual risk outcomes of number of vaginal sex partners or STI status. Furthermore, results did not provide support for the mediating effect of perceived peer risk

norms (as proposed by social control theory). Finally, after accounting for depressive symptoms and perceived peer risk norms as well as covariates, a significant direct longitudinal effect of neighborhood stress on number of partners remained in the model.

Alternative Mediation Models

The alternative hypothesis mediation path analysis tested plausible alternative models to the stress and coping theory and social control theory by reversing the order of the mediating and dependent variables. That is, the alternative path analysis model examined the mediating effects of the five sexual risk variables in the associations of neighborhood stress to depressive symptoms and perceived peer risk norms. The analysis controlled for baseline age, gender, free lunch status, city, and treatment condition as well as baseline levels of all mediator and outcome variables (Figure 3). Baseline neighborhood stress was significantly associated with number of vaginal sex partners at 12 months ($\beta = .08$, $b = 0.07$, $SE = 0.03$, $p = .004$), but not with relative frequency of condom use ($\beta = -.002$, $b = -0.01$, $SE = 0.10$, $p = .95$), count of condom unprotected vaginal sex episodes ($\beta = .000$, $b = 0.000$, $SE = 0.06$, $p = .99$), condom use at last episode ($\beta = -.02$, $b = -0.01$, $SE = 0.03$, $p = .62$), or STI assessment ($\beta = .02$, $b = 0.01$, $SE = 0.01$, $p = .60$) at 12 months. In turn, number of vaginal sex partners at 12 months was longitudinally associated with perceived peer risk norms at 18 and 36 months ($\beta = .09$, $b = 0.11$, $SE = 0.04$, $p = .006$). Count of condom unprotected vaginal sex episodes at 12 months was marginally, longitudinally associated with depressive symptoms at 18 and 36 months ($\beta = .08$, $b = 0.03$, $SE = 0.02$, $p = .09$). No other significant or marginally significant paths between the five mediating sexual risk variables and depressive symptoms or perceived peer risk norms emerged. The model accounted for 26% of the variance in number of vaginal sex partners, 27% of the variance in depressive symptoms, and 16% of the variance in perceived peer risk norms. After accounting

for these indirect paths involving sexual risk variables, the path analysis results indicated that a direct, longitudinal effect of baseline neighborhood stress on depressive symptoms ($\beta = .07$, $b = 0.03$, $SE = 0.01$, $p = .02$), but not on perceived peer risk norms ($\beta = .01$, $b = 0.01$, $SE = 0.03$, $p = .87$), remained significant in the model.

Significance tests of mediation, using Sobel tests and bootstrapped CIs, indicated one marginally significant mediation effect (see Table 5) from neighborhood stress at baseline \rightarrow number of vaginal sex partners at 12 months \rightarrow perceived peer risk norms at 18 and 36 months ($\beta = .01$, $b = 0.01$, 95% bootstrapped CI [0.001, 0.02], $SE = 0.004$, $p = .05$); 100% of the total effect of neighborhood stress on perceived peer risk norms was mediated by number of vaginal sex partners.

In sum, the path analysis results supported the *alternative* hypothesis to social control theory (i.e., that sexual risk mediates the association of neighborhood stress and perceived peer risk norms) by detecting significant paths from baseline neighborhood stress to number of vaginal sex partners at 12 months and then from number of vaginal sex partners at 12 months to perceived peer risk norms at 18 and 36 months. These path analysis results were bolstered by a marginally significant Sobel test and a significant bootstrapped CI for the indirect effects of neighborhood stress on perceived peer risk norms via number of vaginal sex partners. The analyses did not provide any other support for the alternative hypothesis to social control theory. Furthermore, the present analyses did not find any support for the alternative stress and coping model hypothesis (i.e., that sexual risk mediates the association of neighborhood stress and depressive symptoms) via path analysis, Sobel tests, or bootstrap analyses.

Discussion

Traditional cognitive and motivational models that have guided STI/HIV prevention research have yielded promising predictive validity but equivocal intervention results (Albarracín et al., 2005; Goesling et al., 2014). STI/HIV prevention researchers argue that understanding environmental predictors of sexual risk that go beyond the individual level will contextualize sexual risk and, in doing so, help identify broader targets for intervention (DiClemente et al., 2008; Herbst et al., 2005; Smetana, et al., 2006). Past research documents an association between neighborhood stress and sexual risk among adolescents (LaFont & Venable, 2017). However, the lack of methodologically robust longitudinal studies has prevented the establishment of neighborhood stress as predisposing risk factor for sexual risk behaviors. Furthermore, though two theoretical frameworks have proposed possible mediators to account for this association—including depressive symptoms and perceived peer risk norms—scant evidence currently substantiates these hypotheses among adolescents. The present study sought to characterize both the longitudinal effect of neighborhood stress on sexual risk as well as examine potential temporal mediating variables using a large, multicity sample of Black youth.

The first major finding from the present study is that neighborhood stress earlier in adolescence predicted greater diversity of sexual partners up to three years later. Whereas past research has largely relied on cross-sectional research designs, insufficient measures of neighborhood stress, and methodological and statistical weaknesses (see LaFont & Venable, 2017), this study provides evidence of the impact of neighborhood stress on number of vaginal sex partners using a three-year longitudinal research design, a validated measure of neighborhood stress, a variety of sexual risk indicators, and a statistically rigorous model that controlled for free lunch status, gender, age at baseline, city of residence, and baseline levels

of five sexual risk variables. In overcoming many of the methodological weaknesses that characterize past research, the present findings lend greater confidence to the assertion that exposure to neighborhood stress is a predisposing risk factor for a greater number of sexual partners among Black adolescents, independent of baseline sexual risk. Of note, this direct effect of neighborhood stress on number of vaginal sex partners persisted in mediation models and was not accounted for by either of the two proposed mechanisms, depressive symptoms or perceived peer risk norms. Hence, though the present findings clarify the presence of a longitudinal effect of neighborhood stress on greater diversity of partners, what remains to be answered is the explanatory mechanisms that account for this critical effect.

A second major finding relates to support that emerged for the stress and coping model of neighborhood stress. The stress and coping model hypothesizes that an association between neighborhood stress and sexual risk behavior may be due, in part, to the mediating role of depressive symptoms. This hypothesis was supported by path analysis results that revealed a significant longitudinal association between neighborhood stress and depressive symptoms, which, in turn, were longitudinally associated with relative frequency of condom use, count of unprotected sex episodes, and condom use at last episode. This sequence suggests that neighborhood stress influences condom use by increasing depressive symptoms, which, in turn, lead to decreased condom use frequency and increased number of unprotected sex episodes.

The present findings also confirmed support for an indirect, mediating effect of depressive symptoms in the association of neighborhood stress to relative condom use frequency. The results also indicated a trend-level indirect effect from neighborhood stress to count data on the occurrence of unprotected sex, via depressive symptoms. Although neighborhood stress was only associated with relative condom use frequency at trend level and was not associated with

count of unprotected sexual episodes in the main effects model, there were significant bivariate correlations between neighborhood stress and both of these variables. Furthermore, many researchers argue that a significant main effect is not necessary for testing mediation effects, but that in such cases, it is more appropriate to refer to indirect effects, rather than mediating effects (Hayes, 2009).

Taken together, these results provide partial support for the hypothesis that neighborhood stress shapes condom use by inducing depressive symptoms that, in turn, lead to sexual risk behaviors. Whereas previous research has tested this model in adult samples (see LaFont & Vanable, 2017 review), the present study is the first to extend this model to an adolescent sample. Overall, this stress and coping hypothesis helps to partially account for the longitudinal effect of neighborhood stress on relative and absolute condom use frequency. Findings are consistent with the possibility that neighborhood stress induces its effect on condom use by increasing chronic stress and negative affect, and that these feeling states may prompt sexual risk behaviors as an emotion-focused coping response. Emotion-focused coping may involve coping via risky sexual behavior, not just safe sex, because the focus of the coping is to relieve distressing emotions that likely supersede other concerns, including long-term negative health consequences. Emotion-focused coping is also generally considered more maladaptive (compared to problem-focused coping), as it is associated with emotional and behavioral problems in children and adolescents (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). These promising findings point to the importance of research that explores other emotion-focused coping behaviors that may result from neighborhood stress, including substance use. Existing cross-sectional research provides evidence to suggest that the association of neighborhood stress and sexual risk is mediated by substance use (Kalichman et al., 2006;

Senn et al., 2016). Furthermore, serial mediations involving both depressive symptoms and substance use are also starting to be explored (Bowleg et al., 2014; Latkin et al., 2007). Future longitudinal research among adolescents should expand upon these initial studies to confirm substance use as a mediator as well as depressive symptoms and substance use as serial mediators in the association of neighborhood stress and sexual risk.

The third major finding that emerged from the present study concerns the directionality of relations between neighborhood stress, perceived risk norms, and sexual risk behaviors. The model testing social control theory did not support the hypothesis that neighborhood stress influences sexual risk by first influencing the perception of peers' sexual risk behaviors. Instead, findings supported the alternative model hypothesis that neighborhood stress influences the perception of peers' sexual risk behaviors by first influencing an adolescent's own sexual risk, which in turn influences the perception of peers' sexual risk behaviors. The alternative hypothesis model results found that baseline neighborhood stress was longitudinally associated with number of vaginal sex partners, which was in turn longitudinally associated perceived peer risk norms. The indirect effect analyses indicate a trend-level indirect effect of neighborhood stress on perceived peer risk norms that was completely accounted for by number of vaginal sex partners.

In line with these findings, a recent meta-analysis examined whether adolescents tend to select into groups of friends who engage in a similar level of sexual risk behaviors as they do (called selection effects) or if they tend to adapt their own sexual risk behaviors to be similar to that of their friends (called socialization effects). The meta-analysis concluded that though both processes occur, selection effects tend to be stronger than socialization effects (van de Bongart et al., 2015). The present analyses add to this literature by further contextualizing the effects in

relation to neighborhood stress. That is, findings suggest that neighborhood stress possibly sets in motion selection effects by promoting greater sexual risk, which then prompts selecting into peer groups with similar sexual risk norms.

A number of major study hypotheses were not supported. Contrary to hypotheses, the main effects model did not provide evidence for a direct effect of neighborhood stress on counts of unprotected vaginal sex episodes, condom use at last episode, or STI outcomes. Neighborhood stress was, however, longitudinally associated with relative frequency of condom use at trend level ($p = .08$). One potential explanation for neighborhood stress being longitudinally associated with relative condom use and not the other two condom use variables concerns differences in measurement approaches. That is, counts of the number of occasions of unprotected sex provide an *absolute* measure of non-condom use over the past three months. The accuracy of this report may be diminished by recall error. Furthermore, though the condom use at last episode variable is designed to minimize such recall error by assessing the most recent episode only, it is a dichotomous measure of a single sexual encounter and, as such, may not generalize to a person's overall sexual risk behavior patterns. In contrast, the Likert-scale of relative frequency of condom use provides an estimation of the proportion of occasions during which a condom is used. As such, it is not influenced by the overall frequency of sexual activity and may be less prone to recall error. Furthermore, it provides more statistical variability compared to dichotomous measures. Such considerations may help to explain why this one condom use measure yielded an association at trend level whereas the other measures did not.

Regarding the absence of an effect of neighborhood stress on STI outcomes, it is worth noting that the STI outcomes were also not highly correlated with the four sexual risk behaviors (absolute values of the r s ranged from .07 to .11). Rather than indicating that neighborhood stress

does not affect sexual risk because it is not associated with STI assessment results, this null finding may have to do with the link between STI contraction and sexual risk behaviors. That is, vulnerability to STIs requires risky sexual behavior with high risk partners who are at heightened risk for STIs. Hence, these STI results may have been limited by the STI prevalence within the participants' sexual partner pools. Nevertheless, sexual risk behaviors during adolescence are important even if they do not lead to concurrent STI contraction because risk behavior patterns established during adolescence can lead to eventual STI contraction later in adolescence or into adulthood.

In addition to these null main effects, the path analysis model testing the two theoretical frameworks only partially supported the stress and coping model and found no support for social control theory. Though some evidence in support of the stress and coping model predicting condom use emerged, the stress and coping model did not help to explain number of vaginal sex partners or STI outcomes. Hence, the indirect effect of neighborhood stress on sexual risk via depressive symptoms seems to be specific to condom use, and did not generalize to partner diversity or STI outcomes in the present analyses.

Furthermore, there was no evidence in support of the social control theory, which hypothesizes that neighborhood stress exerts its effect on sexual risk indirectly via perceived peer risk norms. Though a previous study found cross-sectional evidence for such a relationship (Voisin et al., 2008), the present findings lend no such support for a longitudinal mediation sequence. Notably, the Voisin et. al (2008) study was also conducted in a convenience sample of detained youth in the state of Georgia, and as such may not generalize to a larger, more nationally-representative sample of Black adolescents. Findings from that study confirmed a serial mediation effect in which exposure to community violence was associated with increased

gang membership, which in turn was associated with greater peer risk norms, which in turn was associated with sexual risk. Hence, it is also plausible that neighborhood stress may affect peer risk norms in so far as it first affects adolescents joining risky groups, such as gangs. This hypothesis is conceptually consistent with the present findings that neighborhood stress increases sexual risk, which then leads to selection into groups with riskier norms around sex, and should be explored in future longitudinal research with a more representative samples of adolescents. Another possible avenue of exploration for the social control theory is how neighborhood stress affects parenting practices, and how these practices in turn may affect sexual risk behaviors among adolescents. Presently, there is evidence that neighborhood stress increases parenting stress (Franco, Pottick, & Huang, 2010; Lamis, Wilson, Tarantino, Lansford, & Kaslow, 2014). The extent to which neighborhood stress engenders parenting practices that ultimately increase sexual risk among adolescents should be explored in future research.

Finally, the alternative model did not lend any evidence to support the alternative hypothesis to the stress and coping hypothesis. The alternative hypothesis predicted that neighborhood stress influences depressive symptoms indirectly via sexual risk behaviors. The lack of evidence in support of this alternative hypothesis affords greater confidence in the above findings that yield support for the stress and coping hypothesis of neighborhood stress and sexual risk.

Summary, Implications, and Future Directions

In sum, the present study lends evidence to suggest that: (a) neighborhood stress earlier in adolescence predicts number of vaginal sex partners up to three years later; (b) there is an indirect effect of neighborhood stress on condom use via depressive symptoms, as proposed by the stress and coping hypothesis; and (c) neighborhood stress exerts a longitudinal effect on

perceived peer risk norms via its influence on number of vaginal sex partners, which in turn influences perceived peer risk norms.

The present results suggest three potential promising routes for intervention: reducing depressive symptoms in youth living in disordered and violent neighborhoods, incorporating a community focus into sexual risk intervention programs, and reducing neighborhood disorder and violence. As for the reduction of depressive symptoms, evidence suggests that both behavioral health and primary care interventions that decrease depression hold promise for decreasing sexual risk behaviors among adolescents (Bai et al., 2018). Primary care may be a particularly promising setting for intervention, as primary care reaches more youth and is the de facto mental health system in the U.S. (Fisher & Dickinson, 2014). Although behavioral health interventions for depression neither directly address neighborhood stress or sexual risk behaviors, the indirect effect of neighborhood stress on sexual risk via depressive symptoms helps identify adolescents living in disordered and violent neighborhoods as an at-risk group who may benefit most from interventions for depressive symptoms. Furthermore, this indirect effect indicates that interventions that reduce depression may hold promise for decreasing sexual risk behaviors as well.

The second promising intervention route involves incorporating a community-level focus into sexual risk intervention programs. That is, expanding sexual risk intervention programs to target not just individual-level cognitive and motivational factors, but also shared, community-level risk factors for STI/HIV risk behaviors may hold promise for bolstering intervention efficacy. One such method for doing this is to identify neighborhood or community members who are considered “opinion leaders” by others in their community and provide them with training in how to shape peer norms around sexual behaviors and reinforce safe sex practices via

community activities and conversations with peers. This method has demonstrated efficacy in reducing sexual risk behaviors among several at-risk populations, including men who have sex with men (MSM; Kelly et al., 1997), low-income women (Sikkema et al., 2000), individuals with severe mental illnesses (Sikkema et al., 2007), and low-income adolescents (Sikkema et al., 2005). Furthermore, research into the cost-effectiveness of this type of program has determined this type of program to be moderately cost-effective, compared to traditional HIV prevention programs (Johnson-Masotti, Pinkerton, Sikkema, Kelly, & Wagstaff, 2005).

The final, most challenging intervention route is reducing neighborhood disorder and violence in hopes of mitigating sexual risk behaviors among adolescents. Future research is needed to clarify whether neighborhood-wide interventions would reduce risky sexual behavior among adolescents. This has not been well-researched (Latkin et al., 2013; Voisin & Berringer, 2015), though some qualitative research suggests that positive neighborhood changes may reduce sexual risk behaviors (Popkin, Leventhal, & Weismann, 2008). Undoubtedly, implementing these types of research projects and interventions pose a substantial challenge and may be unlikely without aid from local, state, or federal governing bodies. Researchers should look for opportunities to capitalize on potential research opportunities afforded by existing government housing projects (see Casciano & Massey, 2012). Such quasi experimental research that tests the impact of community and neighborhood-level enhancements on sexual health may not only help to understand how to reduce the major public health burdens created by sexual risk behaviors, but also hold promise for positively affecting a broader range of health risk behaviors, psychosocial health, and economic potential (Chyn, 2016; Hill, Ross, & Angel, 2005). The benefits would confer not only to those who suffer disproportionately from poverty, poor health, and adverse neighborhood conditions, but would also benefit the larger population by creating a

more optimal society with greater opportunities for wellness and prosperity over disorder, violence, and the health risk behaviors and myriad other social and individual problems they create.

Limitations

The present findings should be considered with respect to limitations of this study. First, though the sample makeup of Black adolescents is considered a strength because it helps inform STI/HIV prevention in the most vulnerable group, the racial homogeneity of the sample prohibits an understanding of how racial/ethnic differences may yield variations in the effect of neighborhood stress on sexual risk. This feature is not unique to the present study, as most existing research in this area includes samples of ethnic minority, mostly Black, adolescents. Notably, as reviewed by LaFont & Venable (2017), studies that did not find an association between neighborhood stress and sexual risk tended to have lower proportions of Black participants compared to studies that yielded positive results. This points to the association of neighborhood stress and sexual risk behaviors potentially being stronger among Black adolescents than their non-Black peers. It is plausible that there are racial/ethnic differences in this effect because of other experiences that are common among racial/ethnic minority groups, such as racial/ethnic discrimination (Brondolo et al., 2005). The hypotheses that there are racial/ethnic differences in the association of neighborhood stress and sexual risk and that discrimination experiences compound the effect of neighborhood stress on sexual risk behaviors should be tested in future research.

Another limitation concerns the present study's inability to more rigorously control for the possible confounding effect of SES. That is, though neighborhood stress is correlated with SES (Ewart & Suchday, 2002), researchers in this area of inquiry seek to examine the unique

effect of neighborhood stress, above and beyond the effects of SES. It is important to know whether environmental conditions, not simply economic status, contribute to the public health burden of sexual risk. The present study's index of SES is a limited, dichotomous variable regarding eligibility for reduced price/free lunch, rather than a more nuanced measure of family income and occupational or educational attainment. Hence, though the current findings control for SES using a single dichotomous measure, it is unclear if using a more nuanced, sophisticated measure of SES would yield similar results. Nonetheless, a large majority of existing research that controlled for SES, even using more nuanced measures such as the Hollingshead index, still found a main effect of neighborhood stress on sexual risk (LaFont & Vanable, 2017).

A third limitation of the present study surrounds the test of the stress and coping hypothesis. The stress and coping hypothesis proposes that psychological distress mediates the association of neighborhood stress and sexual risk behaviors. The present study uses depressive symptoms as a proxy for distress because the iMPPACS study did not measure perceived stress directly. By not measuring perceived stress directly, or its other constituents (e.g., anxiety), the present study has not tested the stress and coping model completely. The encouraging findings that did emerge may be bolstered in future research with the use of other indicators of distress or perceived stress.

Finally, this study relied on self-report to obtain nearly all of the data, with the exception of the STI laboratory results. Self-report data, especially for sensitive information such as sexual risk behaviors, are subject to memory and motivational biases that can undermine validity and interpretability of results. However, we used ACASIs, a data collection approach that minimizes such biases (Romer et al., 1997; Schroder et al., 2003; Vanable et al., 2009). Furthermore, self-reported neighborhood stress was considered a strength of this study because non self-report

indicators of neighborhood stress (e.g., analysis of photos of neighborhoods within one's census tracts) cannot account for varying degrees of exposure that individuals living in the same neighborhood invariably have. Hence, the reliance on self-report data in this study was minimized using computer-administered surveys and is the preferred method for the key neighborhood stress variable.

Conclusion

Existing HIV/STI prevention research has made important strides in identifying cognitive and motivational predictors of sexual risk behaviors. Yet, mixed efficacy for interventions based on these theories has led researchers to explore environmental or contextual factors that may account for additional variance in sexual risk behavior. The present study provides evidence for a longitudinal association between a critical environmental risk factor—neighborhood stress—and number of partners in Black adolescents. Furthermore, this study drew from two theoretical frameworks to explicate the mechanisms that account for this proposed association, and found that neighborhood stress most likely affects sexual risk by inducing distress that leads to decreased condom use. These findings help to advance our understanding of how environmental vulnerabilities shape sexual risk behaviors in adolescents and encourage quasi-experimental research that tests the impact of community and neighborhood-level enhancements on sexual health. Such ongoing research would make scholarly and serviceable strides in the fight against the public health burdens associated with sexual risk behaviors and adverse neighborhood conditions.

Table 1. Means and Standard Deviations of Study Variables

Variable (possible range)	<i>M</i>	<i>SD</i>
Age at baseline (14 – 17)	15.14	1.06
Gender (1 = male, 2 = female)	1.60	0.49
Free lunch status (1 = yes, 2 = no)	1.17	0.38
Neighborhood stress (1 – 4)	1.97	0.67
Depressive symptoms at baseline (1 – 4)	1.57	0.61
Depressive symptoms at 12 months (1 – 4)	1.57	0.66
Depressive symptoms at 18, 36 months (1 – 4)	1.47	0.52
Perceived peer risk norms at baseline (1 – 6)	3.56	0.97
Perceived peer risk norms at 12 months (1 – 6)	3.64	0.86
Perceived Peer Risk Norms at 18, 36 months (1 – 6)	3.79	0.72
# Vaginal sex partners at baseline (0 – 98)	0.94	2.81
# Vaginal sex partners at 12 months (0 – 98)	1.25	3.56
# Vaginal sex partners at 18, 36 months (0 – 98)	1.39	2.88
Relative frequency of condom use at baseline (1 – 6)	4.56	1.77
Relative frequency of condom use at 12 months (1 – 6)	4.18	1.95
Relative frequency of condom use at 18, 36 months (1 – 6)	3.92	1.84
# Condom unprotected episodes at baseline (0 – 300)	2.34	7.12
# Condom unprotected episodes at 12 months (0 – 300)	3.63	16.38
# Condom unprotected episodes at 18, 36 months (0 – 300)	5.10	14.40
Condom use at last episode at baseline (1 = no, 2 = yes)	1.73	0.45
Condom use at last episode at 12 months (1 = no, 2 = yes)	1.66	0.47
Condom use at last episode at 18, 36 months (1 = no, 2 = yes)	1.59	0.42
STI assessment at baseline (0 = negative, 1 = positive)	0.08	0.27
STI assessment at 12 months (0 = negative, 1 = positive)	0.06	0.23
STI assessment at 18 months (0 = negative, 1 = positive)	0.08	0.27

Note. Neighborhood stress = mean of 10 items assessing frequency of stressful neighborhood events on a 1 (never) to 4 (often) scale. Depressive symptoms = mean of 8 CES-D items, frequency of depressive symptoms over the past week on a 1 (less than 1 day) to 4 (5-7 days) scale. Perceived peer risk norms = mean of 2 items assessing amount of same-age friends engaged in vaginal sex and condom use on a scale of 1 (none) to 6 (almost all), coded so that greater score indicates riskier norms. Relative frequency of condom use = frequency of condom use during vaginal sex episodes in the past 3 months on a 1 (never) to 6 (every time) scale. Items with the designation “18, 36 months” indicate that the value represents the average of the 18 and 36 month reports of that variable.

Table 2. Means, Standard Deviations, and Percent Endorsement of City Stress Inventory Items

Item	<i>M (SD)</i>	% Endorsement
I heard neighbors complaining about crime in our neighborhood	2.14 (1.11)	58
I saw strangers who were drunk or high hanging out near my home	2.17 (1.14)	58
There was a gang fight near my home	1.89 (1.06)	48
I saw people dealing drugs near my home	2.17 (1.23)	53
I heard adults arguing loudly on my street in the past year	2.42 (1.11)	70
A family member or friend was robbed or mugged	1.65 (0.78)	48
A family member, friend or acquaintance was stabbed or shot	2.00 (0.99)	60
A family member was attacked or beaten	1.48 (0.83)	30
A family member was stopped and questioned by the police	2.12 (1.06)	61
How many houses or buildings in your neighborhood were vacant or unoccupied?	1.69 (0.72)	57
Mean score of all 10 items (used as independent variable in analyses)	1.97 (0.67)	

Note: Items were rated on a scale of 1 (Never), 2 (Once), 3 (A few times), 4 (Often), with the exception of the last item ("houses or buildings"), which was rated on a scale of 1 (None), 2 (Some), 3 (About half), 4 (Most). % endorsement is the percentage of participants who rated the item a 2 or greater.

Table 3. *Correlations Among Study Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Neighborhood Stress	-																			
2. Dep Symptoms 12 mo	.17**	-																		
3. Peer Norms 12 mo	.12**	.09**	-																	
4. # V Part 18, 36 mo	.17**	.01	.14**	-																
5. Unprotected Ep 18, 36 mo	.07*	.15**	.09**	.12**	-															
6. RF Condom Use 18, 36 mo	-.08**	-.21**	-.19**	.02	-.61**	-														
7. Condom Last Ep 18, 36 mo	-.05	-.19**	-.15**	-.06*	-.52**	.72**	-													
8. STI 18 mo	.03	.06*	.08**	.10**	.08*	-.07*	-.11**	-												
9. Free lunch status	-.10**	.00	.01	.02	-.01	-.03	-.08*	.01	-											
10. Age	.05*	.00	.17**	.13**	.12**	-.14**	-.13**	.06*	.02	-										
11. Gender	-.08**	.24**	-.08**	-.23**	.08*	-.18**	-.16**	.11**	.00	-.04	-									
12. City	-.12**	-.02	-.01	-.03	-.02	-.01	-.02	-.01	-.03	.07**	-.03	-								
13. Treatment condition	-.01	-.00	.01	-.03	.05	-.04	-.04	-.01	-.03	.02	-.03	.40**	-							
14. BL Dep Symptoms	.19**	.52**	.10**	.01	.10**	-.15**	-.17**	.08**	.38*	.09**	.27**	-.07**	-.05*	-						
15. BL Peer Norms	.18**	.08**	.40**	.16**	.10**	-.15**	-.13**	.06*	.02	.20**	-.07**	-.00	-.02	.12**	-					
16. BL # V Part	.19**	.05*	.18**	.38**	.11**	-.13**	-.11**	.07*	.03	.21**	-.23**	-.01	-.03	.02	.26**	-				
17. BL Unprotected Ep	.10*	.06	.11**	.12**	.24**	-.22**	-.18**	.06	.03	.21**	.10**	.00	.01	.16**	.25**	.08*	-			
18. BL RF Condom Use	-.11**	-.13**	-.09*	-.07	-.16**	.22**	.16**	-.09*	-.05	-.12**	-.14**	-.07	-.04	-.22**	-.23**	-.00	-.65**	-		
19. BL Condom Last Ep	-.03	-.07*	-.04	.03	-.11**	.22**	.18**	-.11**	-.07*	-.08*	-.15**	-.03	-.02	-.18**	-.19**	-.01	-.54**	.69**	-	
20. BL STI	.05*	.08**	.09**	.07**	.03	-.06	-.06*	.12**	.02	.10**	.13**	-.02	-.03	.09**	.10**	.16**	.08*	-.13**	-.07	-

Note. $N = 1,612$. Dep Symptoms = depressive symptoms. Peer Norms = perceived peer risk norms. # V Part = number of vaginal sex partners in the past 3 months. Unprotected Ep = number of unprotected vaginal sex episodes in the past 3 months. RF Condom Use = relative frequency of condom use in past 3 months. Condom Last Ep = condom use at last episode (1 = did not use condom, 2 = used condom). STI = STI assessment (0 = negative, 1 = positive). Items with the designation “18, 36 mo” indicate that the value represents the average of the 18 and 36 month reports of that variable. Items with the designation “12 mo” indicate that the variable was measured at the 12 month follow-up. The designation “BL” indicates that the variable was measured at baseline. Free lunch status = whether participant receives free lunch (1 = yes, 2 = no). Age = participant age at baseline. Gender: 1 = male, 2 = female. City was dummy coded as 1 = Syracuse, NY; 2 = Macon, GA; 3 = Providence, RI; 4 = Columbia, SC. Treatment condition was dummy coded as 1 = media city + HIV-prevention group; 2 = nonmedia city + general health promotion group; 3 = media city + general health promotion group; 4 = nonmedia city + HIV-prevention group.

* $p < .05$, ** $p < .01$.

Table 4. *Mediation of Depressive Symptoms and Perceived Peer Risk Norms in the Association of Neighborhood Stress and Sexual Risk*

Predictor	Mediator	Outcome variable	Indirect effect & 95% CI		Direct effect	Total effect	Proportion Mediated
Neighborhood Stress	Depressive Symptoms	# Vaginal Sex Partners	-.001	[-.01, .003]	.06**	.06**	2%
		Relative Condom Use Freq.	-.03*	[-.06, -.003]	-.08	-.11	27%
		Condom Unprotected Episodes	.01^a	[.001, .03]	.01	.03	33%
		Condom Use Last Episode	-.004 ^a	[-.01, .000]	-.004	-.01	40%
		STI Assessment	.000	[-.002, .002]	.002	.003	0%
	Perceived Peer Risk Norms	# Vaginal Sex Partners	.000	[-.001, .003]	.06**	.06**	0%
		Relative Condom Use Freq.	-.004	[-.03, .02]	-.08	-.11	4%
		Condom Unprotected Episodes	.002	[-.004, .01]	.01	.03	7%
		Condom Use Last Episode	-.001	[-.01, .003]	-.004	-.01	10%
		STI Assessment	.000	[-.002, .002]	.002	.003	0%

Note. All estimates are unstandardized. Confidence intervals (CIs) resulted from 1,000 bootstrap draws. Significant and marginally significant estimates are shown in bold font. ^a. $0.05 < p < .10$, * $p < .05$, ** $p < .01$

Table 5. *Alternative Hypothesis Mediation Results*

Predictor	Mediator	Outcome variable	Indirect effect	95% CI of indirect effect	Direct effect	Total effect	Proportion Mediated
Neighborhood Stress	# Vaginal Sex Partners	Depressive Symptoms	0.000	-0.003, 0.003	0.03*	0.03	0%
		Peer Norms	0.01^a	0.001, 0.02	0.01	0.01	100%
	Relative Condom Use Freq.	Depressive Symptoms	0.000	-0.002, 0.002	0.03*	0.03	0%
		Peer Norms	0.000	-0.01, 0.01	0.01	0.01	0%
	Condom Unprotected Episodes	Depressive Symptoms	0.000	-0.004, 0.004	0.03*	0.03	0%
		Peer Norms	0.000	-0.01, 0.01	0.01	0.01	0%
	Condom Use Last Episode	Depressive Symptoms	-0.001	-0.004, 0.002	0.03*	0.03	3%
		Peer Norms	0.002	-0.01, 0.01	0.01	0.01	20%
	STI Assessment	Depressive Symptoms	0.000	-0.001, 0.001	0.03*	0.03	0%
		Peer Norms	0.000	-0.01, 0.01	0.01	0.01	0%

Note. All estimates are unstandardized. Confidence intervals (CIs) resulted from 1,000 bootstrap draws. Significant and marginally significant estimates are shown in bold font. ^a. $0.05 < p < .10$, $*p < .05$.

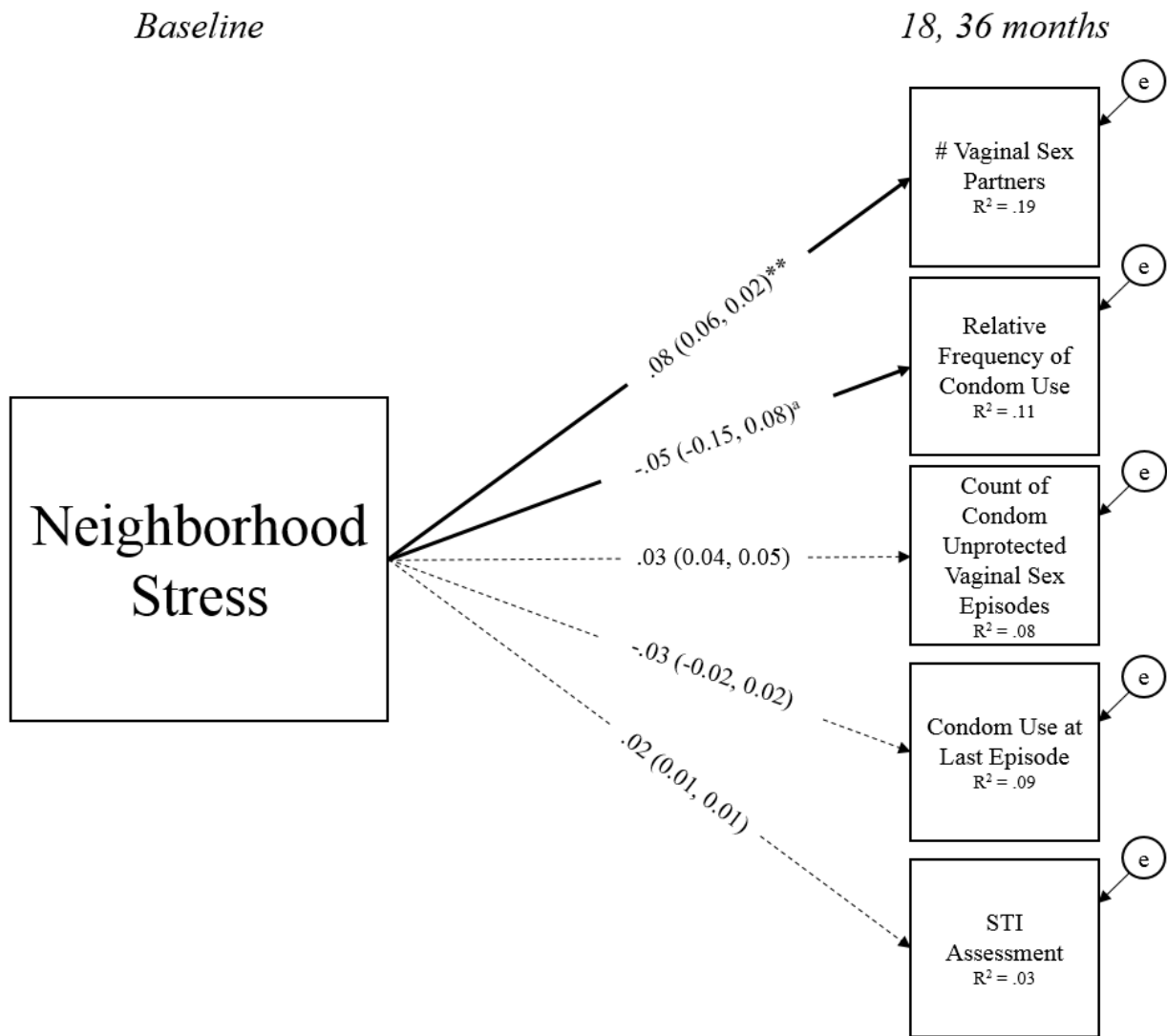


Figure 1. Results of a path model testing the longitudinal association between neighborhood stress and sexual risk behaviors. Nonsignificant paths are shown in dotted lines and statistically significant and marginal paths are shown in solid lines (^a.05 < *p* < .10, ***p* < .01). Paths are labeled with standardized estimates (and unstandardized estimates and standard errors in parenthesis). Gender, age, city of residence, treatment condition, and free lunch status, as well as baseline levels of all of the five sexual risk behaviors and outcomes were included as covariates, though these paths are not shown for simplicity. Analyses also included correlations among covariates and correlations among dependent variables.

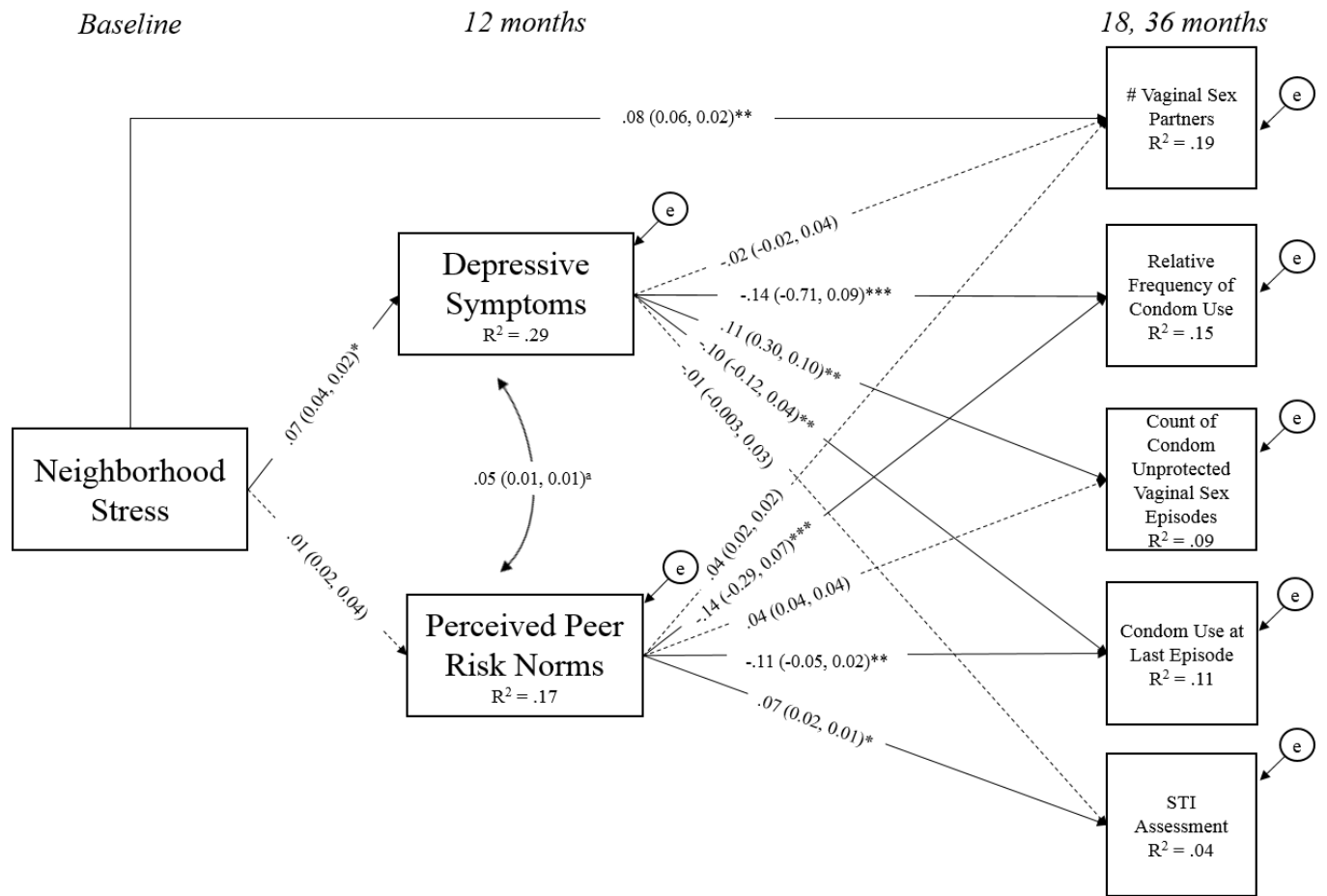


Figure 2. Results of a path model testing the mediating effects of depressive symptoms and perceived peer risk norms in the association of neighborhood stress and sexual risk behaviors and outcomes. Nonsignificant paths are shown in dotted lines and statistically significant and marginal paths are shown in solid lines (^a.05 < *p* < .10, **p* < .05, ***p* < .01, ****p* < .001). Paths are labeled with standardized estimates (and unstandardized estimates and standard errors in parenthesis). Gender, age, city of residence, treatment condition, and free lunch status, as well as baseline levels of depressive symptoms, perceived peer risk norms, and all of the five sexual risk behaviors and outcomes were included as covariates, though these paths are not shown for simplicity. The model also tested the direct effects of neighborhood stress on all five sexual risk behaviors and outcomes, though only significant direct paths are shown for simplicity. Analyses also included correlations among covariates and correlations among all mediating and dependent variables.

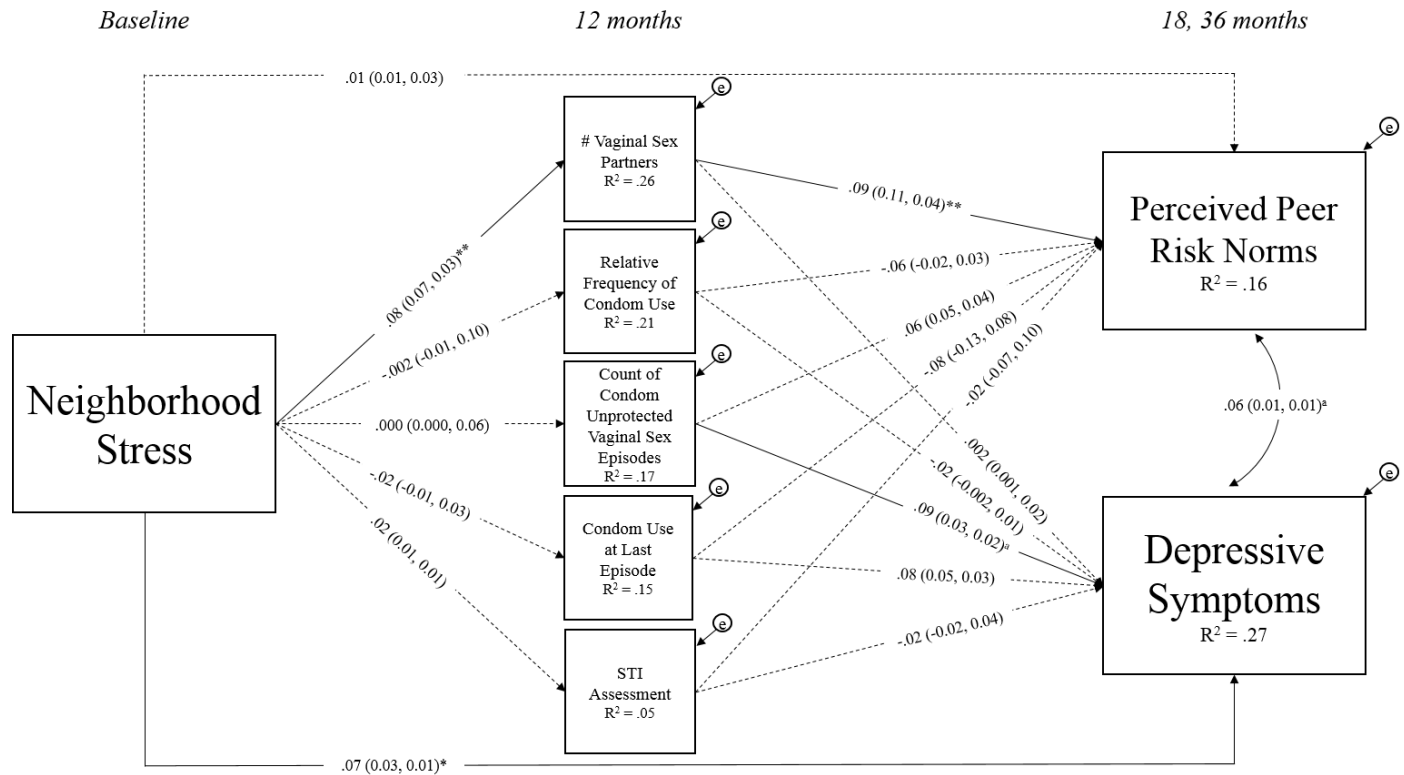


Figure 3. Results of a path model testing the mediating effects of sexual risk behaviors and outcomes in the associations of neighborhood stress with perceived peer risk norms and depressive symptoms. Nonsignificant paths are shown in dotted lines and statistically significant and marginal paths are shown in solid lines (*.05 < p < .10, *p < .05, **p < .01). Paths are labeled with standardized estimates (and unstandardized estimates and standard errors in parenthesis). Gender, age, city of residence, treatment condition, and free lunch status, as well as baseline levels of depressive symptoms, perceived peer risk norms, and all of the five sexual risk behaviors and outcomes were included as covariates, though these paths are not shown for simplicity. Analyses also included correlations among covariates and correlations among all mediating and dependent variables.

Appendix A City Stress Inventory Items

Neighborhood Stress Index

Life in a city can be stressful. We want to know about stress you have experienced in your neighborhood during the PAST YEAR. For each stressful event, please indicate if this event, or something like it, happened in the neighborhood(s) where you lived during the PAST YEAR. Indicate if the event happened, and how often, by selecting one response.

	Never	Once	A few times	Often
NS1. A family member or friend was robbed or mugged in the past year.	1	2	3	4
NS2. I heard neighbors complaining about crime in our neighborhood in the past year.	1	2	3	4
NS3. A family member, friend or acquaintance was stabbed or shot in the past year.	1	2	3	4
NS4. I saw strangers who were drunk or high hanging out near my home in the past year.	1	2	3	4
NS5. There was a gang fight near my home in the past year.	1	2	3	4
NS6. I saw people dealing drugs near my home in the past year.	1	2	3	4
NS7. I heard adults arguing loudly on my street in the past year.	1	2	3	4
NS8. A family member was attacked or beaten in the past year.	1	2	3	4
NS9. A family member was stopped and questioned by the police in the past year.	1	2	3	4
NS10. How many HOUSES or BUILDINGS in your neighborhood were VACANT or UNOCCUPIED during the past year.	None 1	Some 2	About half 3	Most 4

Appendix B

The Center for Epidemiological Studies Depression Scale (CES-D) Items

CES-D Short Form

This set of statements is about how you may or may not have felt during the last week. Select the response that best describes how often you felt like this in the past week.

		Less than 1 day	1-2 days	3-4 days	5-7 days
CES1.	<u>During the past week</u> I felt that I could not shake off the blues even with help from my family and friends.	1	2	3	4
CES2.	<u>During the past week</u> I felt depressed.	1	2	3	4
CES3.	<u>During the past week</u> I thought my life had been a failure.	1	2	3	4
CES4.	<u>During the past week</u> I felt fearful.	1	2	3	4
CES5.	<u>During the past week</u> my sleep was restless.	1	2	3	4
CES6.	<u>During the past week</u> I felt lonely.	1	2	3	4
CES7.	<u>During the past week</u> I had crying spells.	1	2	3	4
CES8.	<u>During the past week</u> I felt sad.	1	2	3	4

Appendix C

Perceived Peer Risk Norms Items

Peer Norms

In this part of the questionnaire, we want to know how many people you know who are about your age are doing each of these behaviors. If you do not know, try and guess as best as possible.

	None	Hardly any	Some	About half	Most	Almost all of them
PN3. Thinking about your friends who are your age, how many would you say have had vaginal sex?	1	2	3	4	5	6
PN5. Thinking about your friends who are your age and are having sex, how many would you say use a male condom every time they have vaginal sex?	1	2	3	4	5	6

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Curriculum Vita

Education

SYRACUSE UNIVERSITY, Syracuse, NY

M.S. Clinical Psychology

Spring 2016

Ph.D. Clinical Psychology (APA Accredited)

Summer 2019

SUNY INSTITUTE OF TECHNOLOGY, Utica, NY

B.A. Double Major in Psychology & Community and Behavioral Health

2013

Minor in Technology & Culture

Summa Cum Laude

Internship

SUNY UPSTATE UNIVERSITY HOSPITAL

September 2018 – August 2019

Intern, Adult Track, Internship in Clinical Psychology at SUNY Upstate Medical University (APA Accredited)

- Director: Roger Greenberg, Ph.D.
- Supervisors: Roger Greenberg, Ph.D., Michael Miller, Ph.D., Kyle Possemato, Ph.D., Susan Sperry, Ph.D., Tammy Bartoszek, Psy.D., Michelle Woogen, Psy.D.
- Provided weekly psychotherapy to a caseload of 8 clients, including clients from the Adult Outpatient Service and SUNY Upstate Medical University's Student Counseling Service.
- Attended weekly didactics in the topics of clinical case formulation, psychotherapy, and childhood trauma.
- Conducted psychological assessments in psychiatric inpatient and outpatient settings. Provided assessment feedback to patients and providers.
- Received supervision on cases from psychodynamic, psychoanalytic, interpersonal, and cognitive-behavioral approaches to therapy.
- Completed a rotation in inpatient psychiatry involving co-facilitating DBT groups, providing daily psychotherapy to a caseload of 2 patients, and attending and participating in multidisciplinary team meetings.
- Completed a rotation in inpatient physical medicine and rehabilitation involving initial psychological assessments, providing ongoing psychotherapy as needed, attending and participating in multidisciplinary team meetings, and attending and participating in family meetings.
- Will complete (March 2019 – May 2019) a child psychiatry rotation involving didactics in child psychiatry and conducting a psychological assessment.

Clinical Experience

SYRACUSE UNIVERSITY

September 2017 – May 2018

Syracuse University Health Services, Syracuse, NY

Behavioral Health Intern

- Syracuse University Health Services specializes in college health and serves the health care needs of Syracuse University and SUNY Environmental Science and Forestry students.
- Worked in an integrated primary care setting to provide consultation to primary care providers and prevention/early intervention to patients reporting subthreshold mental health symptoms.
- Assessed mental health issues and provided brief interventions on behavioral health issues, including insomnia, alcohol/substance use, depression, stress/anxiety, medication adherence, and health behavior change.
- Educated primary care providers about mental health issues and helped them improve their skills in discussing them with their patients.
- Supervisor: Jennifer Funderburk, Ph.D.

SUNY UPSTATE UNIVERSITY HOSPITAL

September 2017 – May 2018

Upstate Concussion & Cancer Centers, Syracuse, NY

Student Clinician

- The Upstate Concussion Center provides comprehensive evaluation and treatment services for concussion and sports concussion.
- The Upstate Cancer Center is a comprehensive resource center for cancer care that offers outpatient treatment and support services.
- Provided individual therapy to Concussion Center and Cancer Center patients.
- Psychotherapy focused on helping patients improve their health behaviors, strengthen their stress management, and cope with their medical conditions
- Supervisors: Brian P. Rieger, Ph.D., Jeffrey R. Schweitzer, Ph.D.

HUTCHINGS PSYCHIATRIC CENTER

September 2016 – May 2017

OnTrack CNY, Syracuse, NY

Student Clinician

- OnTrack CNY is a state funded program at Hutchings Psychiatric Center that provides assessment and treatment for adolescents and young adults with first break psychotic symptoms / prodromal symptoms of schizophrenia.
- Conducted intake interviews.
- Conducted assessments, including psychodiagnostic assessments as well as academic achievement and intelligence testing.
- Provided assessment feedback to clients and their families.
- Co-facilitated group therapies, including social skills groups for clients and group therapy for clients' families.

- Performed outreach tasks and community presentations.
- Participated in ongoing training/consultation from OnTrack Central at Columbia University.
- Supervisor: Julie Aspenleiter, Psy.D.

SYRACUSE UNIVERSITY January 2015 – May 2016 & May 2017 – August 2017
Psychological Services Center, Syracuse, NY

Therapist

- Conducted intake, clinical, ADHD, and Learning Disorder assessments.
- Provided interpretations, feedback, and recommendations based on assessment results.
- Provided weekly psychotherapy to a caseload of 8 clients.
- Received supervision on cases from psychodynamic, interpersonal, humanistic, and cognitive-behavioral approaches to therapy.
- Participated in didactic learning of CBT, DBT, and psychodynamic techniques.
- Scheduled weekly appointments in Titanium electronic medical record and maintained client billing.
- Supervisors: Afton Kapuscinski, Ph.D., Kevin M. Antshel, Ph.D., Deborah Pollack, Ph.D., Amy Olszewski, Ph.D., Robbi T. Saletsky, Ph.D., Jessica Costosa-Umina, Ph.D., Whitney Wood, Ph.D., Sarah Felver, Ph.D., Aaron Gleason, Ph.D.

SYRACUSE UNIVERSITY May 2015 – July 2015
Psychological Services Center, Syracuse, NY

Group-Co Facilitator, Social Skills Training group

- The Social Skills Training group (SST) at Syracuse University is a 10-week CBT intervention that focuses on conversation skills and social problem solving skills for children with autism spectrum disorders (ASDs) and common comorbid disorders.
- I co-facilitated weekly SST group therapy sessions.
- Supervisor: Kevin M. Antshel, Ph.D.

UPSTATE CEREBRAL PALSY February 2012 – August 2012
Community Health & Behavioral Services, Utica, NY

Undergraduate Intern / Volunteer

- Co-facilitated group therapies.
- Created Powerpoint presentations and handouts on various types of therapies.
- Completed paperwork, including attendance sheets, filling out the monthly mandatory Medicaid review paperwork, and discharge & withdrawal paperwork.
- Performed outreach tasks (phone calls and letters) and their involved paperwork.
- Attended weekly staff meetings.

Supervision Experience

SYRACUSE UNIVERSITY

August 2017 – May 2018

Psychological Services Center, Syracuse, NY

Peer Supervisor

- Provided weekly, direct, one-on-one clinical supervision to a junior clinical psychology graduate student for an individual psychotherapy case.
- Reviewed supervisee's progress notes and treatment plans.
- Provided feedback to and evaluation of the supervisee.
- Received a tiered supervision wherein I also received weekly supervision and didactic training on clinical supervision from a licensed clinical psychologist.
- Supervisor: Afton Kapuscinski, Ph.D.

Clinical Conferences Attended

Allan Abbass, M.D. Direct Assessment and Treatment of Emotional Factors in Psychosomatic Conditions. Sponsored by the University of Rochester Medical Center. December 7, 2017 in Rochester, NY.

Robert Gregory, M.D. Workshop in Dynamic Deconstructive Psychotherapy (DDP). Sponsored by the Syracuse University Counseling Center. August 16, 2017 in Syracuse, NY.

Shawn C. Shea, M.D. Uncovering Suicidal Ideation and other Dangerous Secrets in College Students. Sponsored by the Syracuse University Counseling Center. January 11, 2017 in Syracuse, NY.

Nancy McWilliams, Ph.D. The Good Life: Psychotherapeutic Approaches to Wellness, Aging and Mortality. Sponsored by The Psychological Association of Western New York. October 1, 2016 in Buffalo, NY.

ADOS-2 Clinical Training. Sponsored by SUNY Upstate Medical University and Motion Intelligence. June 4 – 5, 2016 in Syracuse, NY.

The 9th Annual Naomi Chernoff, M.D. Creativity Conference: Humor, Meaning, Caring, (Non)Sense and Freedom in the Healing Process. Sponsored by The SUNY Psychiatry Department's Division of Psychotherapy. October 9, 2015 in Syracuse, NY.

Research Experience

SYRACUSE VA MEDICAL CENTER

August 2016 – May 2017

Center for Integrated Healthcare, Syracuse, NY

Graduate Research Assistant / Health Science Specialist

- Conducted assessments and research sessions for a randomized clinical trial (RCT) designed to test the efficacy of a 4-session brief behavioral activation treatment for depression in primary care.
- Conducted medical chart review and qualitative telephone interviews with at-risk Veterans.
- Supervised undergraduate research assistants.
- Supervisors: Jennifer Funderburk, Ph.D., Stephen Maisto, Ph.D.

SYRACUSE UNIVERSITY

August 2013 – Present

Falk College of Public Health, Syracuse, NY

Graduate Research Assistant for the Environmental Exposures and Child Health Outcomes (EECHO) study

- Environmental toxicants pose grave health risks for children and adults alike. The EECHO aims to examine the impact that such toxicants (i.e., lead) have on the health of Black and White children ages 9 - 11 who live in Syracuse area zip codes.
- I conducted standardized, semi-structured qualitative interviews (the Social Competence Interview) with primary caregivers and their children. Interview topics included chronic stressors and coping strategies.
- I served as the project's data manager from August 2014 to May 2015.
- Supervisors: Brooks B. Gump, Ph.D., M.P.H. & Craig K. Ewart, Ph.D.

SYRACUSE UNIVERSITY

August 2013 – Present

Department of Psychology, Syracuse, NY

Research Assistant for Project Heart

- Cardiovascular disease (CVD) remains the #1 cause of death in the United States. Through a series of longitudinal studies (Project Heart) spanning over 20 years, the Project Heart Lab has been studying determinants of CVD risk in low-income, largely minority populations.
- The Project Heart lab examines relationships between psychological stress and biomarkers of health (e.g., blood pressure, heart rate variability, arterial stiffness, cortisol) that indicate the development of risk for CVD.
- Supervisor: Craig K. Ewart, Ph.D.

SUNY INSTITUTE OF TECHNOLOGY

August 2012 – August 2013

Department of Psychology, Utica, NY

Undergraduate Research Assistant

- Using data from the 2011 Oneida County Teen Assessment Project (TAP) survey, we examined Adverse Childhood Experiences (ACEs) as a risk factor for bullying behaviors. Our model also included social support scales (school, family, & community) as moderating variables.
- I presented our findings on 5/22/13 to the Oneida County Youth Council in New Hartford, NY.
- Supervisors: Joanne Joseph, Ph.D. & Veronica Tichenor, Ph.D.

Publications

- LaFont, S. R.**, Brondolo, E., Dumas, A. K., Lynk, N. C., & Gump, B. B. (2018). The development and initial validation of the child perceived discrimination questionnaire. *International Journal of Culture and Mental Health, 11*(2), 208-219. doi: 10.1080/17542863.2017.1356337
- LaFont, S. R.** & Venable, P. A. (2017). *The association of neighborhood stress and sexual risk behaviors: A systematic review and synthesis of the literature*. Manuscript in preparation.
- LaFont, S. R.**, Venable, P. A., Brown, L. K., Carey, M. P., DiClemente, R. J., Romer, D., & Valios, R. F. (2016). *Is neighborhood stress longitudinally associated with sexual risk behavior and substance use among African American adolescents?* Manuscript in preparation.
- Ewart, C. K., He, J. A., **LaFont, S. R.**, Parekh, M., Park, A., Gump, B. B., & Fitzgerald, S. T. (2016). *Measuring experiences of social exclusion and devaluation in multiracial populations: The Social Rejection and Denigration Scales*. Manuscript in preparation.

Conference/Research Presentations

- LaFont, S. R.**, Gump, B. B., & Ewart, C. K. (2017). Response modulation moderates the effect of agonistic striving on cardiovascular disease risk in children. Poster presented at the Central New York Psychological Association Annual Dinner Meeting, Syracuse, NY.
- LaFont, S. R.**, Venable, P. V., Carey, M. P., Brown, L., DiClemente, R., Romer, D., & Valios, R. (2016). Neighborhood Stress is Longitudinally Associated with Risky Sexual Behavior among African American Adolescents. Paper presented at: *Thirty-Seventh Annual Meeting & Scientific Sessions of the Society of Behavioral Medicine*, Washington, DC.
- LaFont, S. R.**, Gump, B. B., & Ewart, C. K. (2015). Implicit agonistic striving in both child and parent is associated with increased hypertension risk in the child. Poster presented at: *Seventy-Third Annual Scientific Meeting of the American Psychosomatic Society*, Savannah, GA.
- LaFont, S. R.**, Elder, G. J., Parekh, M., Schoolman, J. H., He, J. A., Fitzgerald, S. T., & Ewart, C. K. (2014). Dissipated striving predicts increased hypertension risk in persons with symptoms of depression. Poster presented at: *Seventy-Second Annual Scientific Meeting of the American Psychosomatic Society*, San Francisco, CA.
- Elder, G. J., Parekh, M., Schoolman, J. H., He, J. A., **LaFont, S. R.**, Fitzgerald, S. T., & Ewart, C. (2014). Social support and cardiovascular stress: the positive perception of social support buffers against stress of negative interactions with support providers in the natural

environment. Poster presented at: *Seventy-Second Annual Scientific Meeting of the American Psychosomatic Society*, San Francisco, CA.

Schoolman, J. H., Elder, G. J., Velasquez, H.A., Parekh, M., He, J. A., **LaFont, S. R.**, Fitzgerald, S. T., & Ewart, C. (2014). Self-reported depressive symptoms predict metabolic syndrome in adults. Poster presented at: *Seventy-Second Annual Scientific Meeting of the American Psychosomatic Society*, San Francisco, CA.

Parekh, M., Elder, G. J., Schoolman, J. H., He, J. A., **LaFont, S.R.**, Fitzgerald, S. T., & Ewart, C. (2014). Does transcendence striving buffer the cardiovascular stress of social interaction in persons with hypertension? Poster presented at: *Seventy-Second Annual Scientific Meeting of the American Psychosomatic Society*, San Francisco, CA.

Competencies & Techniques

Clinical Administration & Interpretation

Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)
Wechsler Adult Intelligence Scale – 4th edition (WAIS-IV)
Wechsler Intelligence Scale for Children—5th edition (WISC-V)
Wechsler Individual Achievement Test– 3rd edition (WIAT-III)
Minnesota Multiphasic Personality Inventory (MMPI-2)
Personality Assessment Inventory (PAI)
Million Clinical Multiaxial Inventory – Fourth Edition (MCMI-IV)
Conners Continuous Performance Test – Third Edition (CPT-3)
Gordon Diagnostic System Vigilance Task (GDS)
Wisconsin Card Sorting Test (WCST)
Controlled Oral Word Association, FAS and Animal Naming (COWA)
California Verbal Learning Test – Children’s Version (CVLT-C)
California Verbal Learning Test – Second Edition (CVLT-2)
Clock Drawing Test
Rey-Osterrieth Complex Figure (ROCF)
Test of Memory Malinger (TOMM)
Trail Making Test (TMT)
Adaptive Behavior Assessment System, Third Edition (ABAS-3)
Vineland Adaptive Behavior Scales, Third Edition (Vineland-3)
Behavior Assessment System for Children, Second Edition (BASC-2)
Behavior Assessment System for Children, Third Edition (BASC-3)
Screen for Child Anxiety Related Disorders (SCARED)
World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0)
Barkley Symptom Scales – Current and Childhood (Other Report)
World Health Organization ADHD Adult-Self-Report Scale (ASRS)
Beck Anxiety Inventory (BAI)
Beck Depression Inventory, 2nd Edition (BDI-II)
Patient Health Questionnaire – 9 (PHQ-9)
Perceived Stress Scale (PSS)

Alcohol Use Disorders Identification Test (AUDIT)
Cannabis Use Disorder Identification Test- Revised (CUDIT-R)

Statistical & Laboratory

SPSS for Data Entry & Analysis
SAS for Data Analysis
Mplus for Data Analysis
G*Power for Statistical Analysis
Social Competence Interview

Teaching Experience

SYRACUSE UNIVERSITY

Summer 2016

Department of Psychology, Syracuse, NY

Instructor

Abnormal Psychology PSY 395

- This course surveyed a broad range of topics related to psychopathology. Topics discussed included: Characteristics of various psychological disorders as defined in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5), scientific methods for studying psychopathology, theories on etiology of psychopathology, empirically-supported approaches to treatment of psychopathology, and current ethical and philosophical controversies regarding classification, diagnosis and treatment of psychopathology.

SYRACUSE UNIVERSITY

Summer 2014

Department of Psychology, Syracuse, NY

Instructor

Health Psychology PSY 382

- This course explored the relationship between behavior and health. All topics were covered from a biopsychosocial perspective, illustrating the interaction among variables within an individual's environment, body, and behavior. Topics discussed within the course included: Medical adherence, psycho-neuroimmunology, anger/hostility and health, weight control, eating and exercise, health care systems, heart disease, HIV/AIDS, stress, and complementary/alternative treatments.

SYRACUSE UNIVERSITY

Fall 2013 – Spring 2014

Department of Psychology, Syracuse, NY

Teaching Assistant to Tibor Palfai, Ph.D.

Foundations of Human Behavior, PSY 205

- This position involved teaching four weekly recitation classes of approximately 20 students each, leading classroom lecture and discussion, and grading student assignments, quizzes, and papers.

Other Academic Work Experience

SUNY INSTITUTE OF TECHNOLOGY

August 2010 – December 2011

Learning Center, Utica, NY

Statistics & Psychology Tutor

- Assisted Statistics 100 students with homework assignments and exam preparation.
- Assisted Psychology students with course assignments and exam preparation.

Service

CENTRAL NEW YORK PSYCHOLOGICAL ASSOCIATION

September 2017 – May 2018

Syracuse, NY

Student Representative Board Member

- Attended CNYPA monthly board meetings and voted and spoke on behalf of psychology graduate students.
- Served as liaison between CNYPA and psychology graduate students.

UPSTATE UNIVERSITY HOSPITAL

October 2017

Upstate Concussion Center, Syracuse, NY

- Presented on motivational interviewing to the Upstate Concussion Center staff members.

SYRACUSE UNIVERSITY

August 2017

Psychological Services Center, Syracuse, NY

Student-Led Orientation Leader

- Organized and conducted a student-led orientation session for 3rd year graduate students beginning their assistantships at the Psychological Services Center.

CENTRAL NEW YORK PSYCHOLOGICAL ASSOCIATION

September 2015 – April 2016

Syracuse, NY

Graduate Student Volunteer

- Worked with CNYPA President Dr. Deborah Pollack and other graduate students to develop CNYPA's webpage, including researching and writing about various mental health careers and psychological disorders.

SYRACUSE UNIVERSITY

September 2015 – April 2016

Department of Psychology, Syracuse, NY

Clinical Area Student Representative

- Conducted surveys of graduate students on important decisions/issues.
- Attended monthly Clinical faculty meetings and voted on behalf of graduate students on agenda items.
- Served as liaison between Clinical faculty and graduate students.
- Attended Psychology Action Committee meetings and updated students on matters/business of the Clinical department.

SYRACUSE UNIVERSITY

Fall 2014 & Fall 2016

Psychology Action Committee, Syracuse, NY

Graduate Student Mentor

- Served as a mentor for an incoming first year student in the Syracuse University Clinical psychology Ph.D. program.

Professional Memberships

Psi Chi Honor Society

April 2012 – Present

Future Professoriate Program

Fall 2014 – Spring 2016

Women in Science & Engineering (WiSE) Future

Professionals Program

Fall 2014 – Spring 2016

American Psychosomatic Society

March 2014 – Present

American Psychological Association,

Division 38 (Health Psychology)

June 2014 – Present

Central New York Psychological Association
Society of Behavioral Medicine

December 2015 – Present
March 2016 – Present

Awards & Honors

Syracuse University Psychology Department
Award for Conference Travel, \$400

March 2014, 2015, & 2016

Syracuse University Graduate Student Organization
Award for Conference Travel, \$225 - \$250

March 2014 & 2015

SUNYIT President's Award

May 2013

- The President's Award was given to a graduating student who has a distinguished academic record, has demonstrated leadership to the college, the community or the discipline, and exhibits exceptional standards of moral character.

SUNYIT Academic Creativity Award

May 2013

- This award was given to the student who demonstrated an ability to think creatively about psychological principles and application.

SUNYIT Academic Excellence Award

May 2013

- This award was given to the student who earned the highest GPA in Psychology.

Chancellor's Award for Student Excellence

April 2013

- This honor recognized outstanding academic achievement and contributions to the university community. Presented by Nancy J. Zimpher, Chancellor of The State University of New York.

Who's Who Among Students in American Universities & Colleges

April 2012